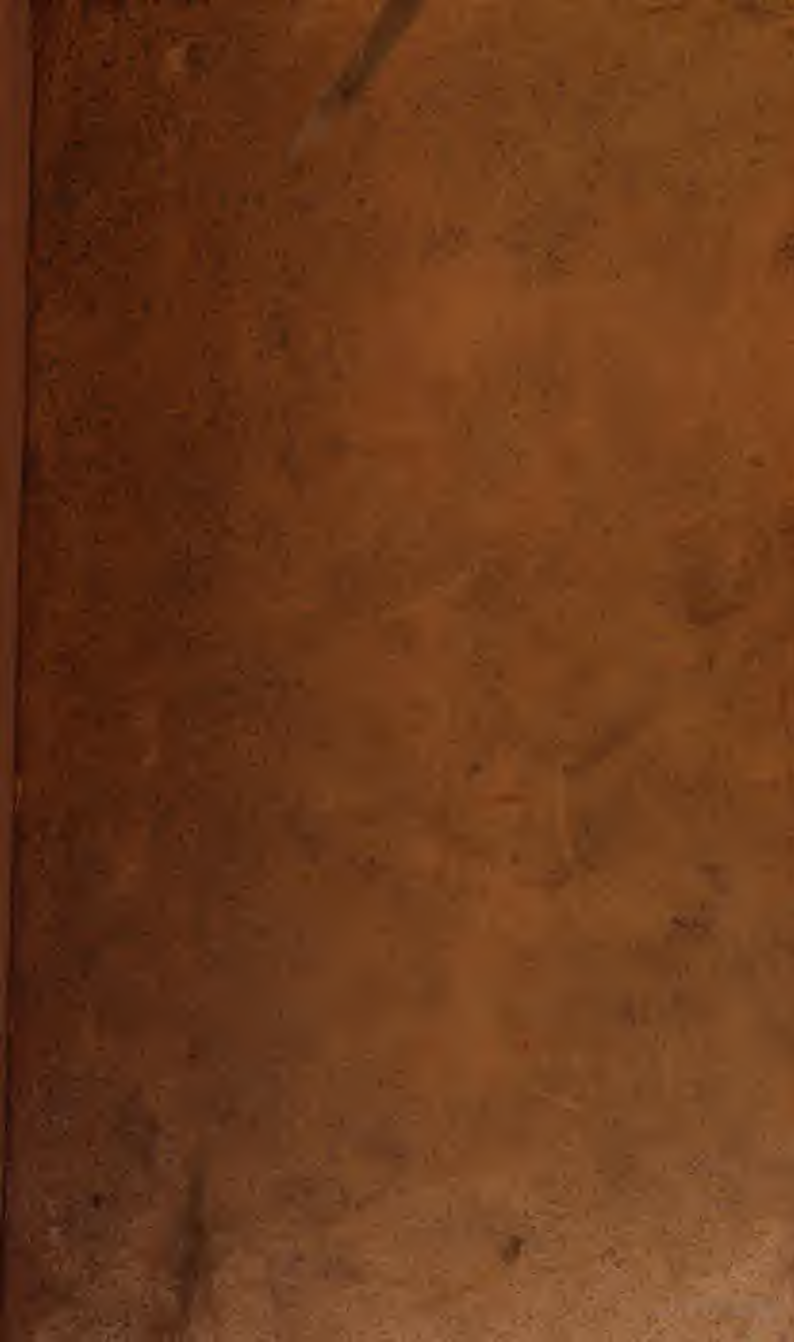




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THE ZOOLOGICAL JOURNAL.

April, 1825.

ART. I. INTRODUCTORY ADDRESS, *explanatory of the views of the ZOOLOGICAL CLUB, delivered at its foundation, November 29, 1823, by the Chairman, the Rev. WILLIAM KIRBY, M.A. F.R. & L.S.**

GENTLEMEN,

BEFORE we proceed to business, permit me to address a few words to you, upon what appear to me to be the principal objects of our association, and upon the best methods of carrying them into effect. I see many Gentlemen here present who, from their more extended knowledge of every branch of the science from which we take our name, are much more competent than myself to perform this task to your satisfaction, and upon some one of them I could wish it had devolved: but as your kindness has placed *me* in this chair, I will endeavour to fulfil this part of my official duty to the best of my abilities. I must previously state, however, that particular circumstances and engagements have unavoidably prevented my putting my thoughts together till after my arrival in town. They have, in consequence, been arranged more hastily than I could have wished, and without the aid of books. I must therefore solicit your indulgence for any imperfections of style or matter that may strike you in this address.

Zoology may be regarded as including several provinces, in every one of which our knowledge is at present very imperfect; and therefore contributions upon every subject which they in-

* See Zoological Journal, Vol. I. p. 132.

clude, as your taste and turn of mind may lead you, provided there is no waste of time and talent upon what is trivial and uninteresting, or has been already thoroughly investigated, will be acceptable and valuable.

There is one of these provinces that I think ought to stand high in the esteem of every *patriot* Zoologist—I mean the study of the animals that are natives or periodical visitants of his own country. An indigenous *Fauna* is the first desideratum in our science ; and could a work of this kind be accomplished in every country, regard being had to natural boundaries, we might hope to become acquainted with all the principal groups of animals, and get a much more correct idea, than with our present imperfect knowledge we can attain to, of the genuine *Systema Animalium*, with all its affinities and analogies as concatenated and contrasted by its Great Author.

With respect to Great Britain, in our sister science of Botany a vast deal more has been effected than in Zoology. Our indigenous Floras, if we may form a judgment from the very few new plants, that after a very general investigation of the three kingdoms have been discovered, contain nearly a complete list of its *phanogamous* vegetable productions. In the *cryptogamous* department more numerous discoveries may be expected ; but still even here the Botanist is before the Zoologist, at least with regard to *invertebrate* animals. The *Vertebrata* indeed of our islands, with the exception perhaps of those that inhabit our seas, are already, for the most part, well known and described ; and all that seems to be wanted here is a more perfect acquaintance with their manners and economy, and with the varying appearances put on by some of them,—I speak particularly of the *Birds*, in different periods of their growth. But undescribed British *invertebrate* animals daily flow in upon us in shoals ; and perhaps it would not be speaking too largely were I to assert, that, excepting the *Lepidoptera* order in insects (for a more complete knowledge of which we are indebted to a gentleman near me*) not one in ten, and in some orders not one in twenty,—I speak this with regard to insects, and under the eye of a friend† who can correct

* Mr. Haworth.

† Mr. Stephens.

me if I have made an overcharged statement,—have been described as British. What is the cause of this difference between the two sister sciences? It has happened, because perhaps the beauties with which Flora allures us, are more open to general view and require less investigation, that Botany has the advantage of first attracting the regards of the admirers of nature; and as she started first, so of course she has made the greatest progress. But Zoology is now marching after her with rapid strides, and I trust will in time overtake her, so that the sisters may run the remainder of their race, as they should do, hand in hand together. Another cause is the infinite number, even of indigenous species, of the invertebrate animals, so that it should seem that a complete Fauna, if undertaken by a single individual, must be left as a legacy to a successor for completion. *Vita brevis, Ars longa*, is a most discouraging apophthegm to the general zoologist, who without Herculean stamina undertakes the labours of a Hercules: but *Vis unita fortior*, what one man cannot hope to accomplish in the usual term of human life, may easily and well be done where many unite their forces for that purpose. Did a number of individuals, sufficiently conversant with their science, combine to produce a British Fauna, each undertaking a separate department suited to his talents and previous pursuits, the grand desideratum might at length be effected. It strikes me that this object might be put in train by the means and under the patronage of the Zoological Club. I see now around me a number of Gentlemen sufficiently learned in nature, and several who have drunk deeply at her well-spring of knowledge, who, if once they undertook the task, would accomplish it with the highest credit to themselves and to the great advantage of the science they cultivate. Let the members of our new-born institution, amongst other subjects, discuss this point amongst themselves at their meetings—weigh the difficulties—investigate the means—consider the proper persons—apportion the work—set their shoulders to the wheel, and the thing will be half done; for most true is that aphorism—

Dimidium facti, qui bene cepit, habet.

But let me not be misunderstood on this subject; I do not mean that such a work should be read at our meetings, or appear in the

Transactions of our venerable Parent Society. This would be inconsistent with the nature of a Fauna, which ought to be published in a different form, and appeal more directly to the public for support on the ground of its own merits.

Another important object of our association with regard to indigenous Zoology is this—That insulated observations made by individuals upon the habits and economy of animals may not be lost. Few persons have an opportunity of tracing the whole proceedings and life of any species of animal; but almost every one has it in his power to relate some interesting trait, to record some illustrative anecdote, of the beings that he beholds moving around him in every direction. None of these fragments should be lost, since each may lead to important conclusions; and the whole concentrated may often form a tolerable comment, and throw great light on some perplexing text of nature. Under this head I may observe, that peculiar care and caution are requisite in noting the habitats and food of animals, particularly insects; since great mistakes have arisen, and been propagated by high authority*, from collectors being too hasty in forming their opinions on this subject.

Bare catalogues of the animals of a district, as such, are of little interest or utility; but when the localities of the *Animalia rariora* are given, or a district catalogue is worked into a *catalogue raisonnée*, and includes facts before unknown with regard to the animals it registers, it becomes a useful document. To note the soil, the kind of country and atmosphere that particular animals affect, makes such a catalogue more interesting. The relative proportion, where glimpses of it can be obtained, that different species bear to each other, or their numerical distribution in any given district, is a speculation worthy of the attention of the zoologist; and likewise to obtain as full an account as possible of those which are particularly detrimental to us either in the garden, the orchard, the forest, or the field.

* For instance, *Curculio Alliarie* L. (*Rynchites* Herbst) really feeds upon the hawthorn, from which it may readily be conceived to drop frequently upon *Erysimum Alliaria*, which always grows in hedges; and *Rynchænus Fragarie* E. (*Orchestes* Oliv.) feeds upon the beech, from which it may have dropped upon the strawberry.

No papers will be more interesting than those which pursue the history of an individual through its different states; and nothing is more important for the satisfactory elucidation of natural groups of insects, and in many cases to prove the distinction of kindred species, than the knowledge of their larvæ.

The above, and many others that I might name did the time permit, appear to be legitimate objects of a Zoological Society with respect to our *indigenous* animal productions. What further observations I have to submit to your consideration will relate to *Zoology in general*. No one who wishes to be at home on the subject will confine his attention to the animals of his own country. Doing this, he will acquire only shreds and patches of knowledge, and see nothing in its real station.

When we consider the infinite number of nondescript animals, especially of insects, with which our cabinets swarm—the hosts of new forms that meet our eyes in every collection—the zoological treasures that our ships, whose sails over-shadow every navigable sea, are daily bringing into our ports, we cannot help lamenting that these, for the most part, must remain

— *sine nomine turba*.

But let us flatter ourselves that the society, whose birth we may date from this auspicious day,* will be the instrument of bringing to light and knowledge many a curious and interesting group, which would otherwise have remained unknown. *Nomina si pereunt, perit et cognitio rerum*, says Linné. Names are the foundation of knowledge; and unless they have “a name” as well as “a local habitation” with us, the zoological treasures that we so highly prize might almost as well have been left to perish in their native deserts or forests, as have grown mouldy in our drawers or repositories. But when once an animal subject is named and described, it becomes a *χρυσὴν ἐσθλὴν*, a possession for ever, and the value of every individual specimen of it, even in a mercantile view, is enhanced.

It is extremely desirable, when gentlemen, moved by such considerations, set about naming and describing the animals, hitherto not so distinguished, which their cabinets contain, that they

* November 29, the birth-day of Ray.

should copy the example of a learned friend near me,* who has done this in a style of superior excellence, and endeavour to elucidate natural groups; as this will, more than any other method, tend to set wide the limits of our knowledge in this department: but at any rate we ought to avoid giving insulated descriptions of a single species, unless it be remarkable either for its economy or structure; or belongs to a genus containing few known species; or fills a gap in any group. With regard to *indigenous* animals, it seems more important that new species should be described as they are discovered, this being a piece of domestic intelligence, which always comes home to us.

When we are engaged in the study of animals, and more especially of groups of them, it is of the first importance, if we would avoid mistakes, that our attention should be kept alive to what the friend lately alluded to has said on the subject of affinity and analogy. By his judicious observations on this subject he has opened a new door into the temple of nature, and taught us to explore her mystic labyrinths, guided by a safer clue than we were wont to follow. And whoever casts even a cursory glance over her three kingdoms will every where be struck by resemblances between objects that have no real relation to each other. He will see on one side *dendritic* minerals, on another *zoomorphous* plants, on a third *phytomorphous* animals; and amongst animals themselves he will see numberless instances of this simulation of affinity where the reality of it does not exist. From this part of the plan of the Creator we may gather, I think, that every thing has its *meaning* as well as its *use*; and that probably to the first pair the Creation was a book of symbols, a sacred language; of which they possessed the key, and which it was their delight to study and decypher.

But to return from this digression.—Every circumstance connected with the geographical distribution of animals is extremely interesting and important, and merits our full attention. There is often something very remarkable in the range of particular tribes and genera. Some animals, for instance, are common both

* Mr. W. S. MacLeay.

to the Old World and the New, while others occupy a more limited station; some have as it were their metropolis, from which as they recede, they become gradually less numerous. Some again that are found inhabiting the *plains* of a *cold* country, take their station on the *mountains* of a *warmer* one. Every quarter or principal district of the globe has likewise its peculiar types, so that a practised zoologist can often lay his finger upon an animal that he never saw before, and say confidently, This is of *Asiatic* origin—this of *African*—this of *American*—this of *Australasian*: and even in cases where creatures from these countries are apparently synonymous with those of *Europe*, there is, not unfrequently, a note of difference, that speaks their *exotic* birth. As the importance of assigning their genuine country to our animal specimens is now universally acknowledged, it would be a very useful labour, and form a very valuable communication, would any gentleman, properly qualified, undertake the correction of some of the numerous errors, with regard to their real *habitat*, that zoologists have propagated concerning the animals they have described.

I must not pass without notice another branch of our science, of the deepest interest and highest importance, and more particularly as we have to lament that hitherto it has been very imperfectly cultivated, especially with regard to invertebrate animals, in these islands,—I mean the *Comparative Anatomy* of animals. France, in which this science has attained to its acme, can boast of her Cuvier, Savigny, Marcel de Serres, De Blainville, Chabrier, and others; Germany of her Blumenbach, Ramdohr, Treviranus, Herold, and a host besides; Italy of her Malpighi, Spallanzani, Scarpa, and Poli; Holland of her Swammerdam and Lyonnet: but the only boast of Britain, an illustrious one indeed, *nec pluribus impar*, in this department, is her Hunter; and even he, if my recollection does not fail me, employed his scalpel chiefly on the higher orders of animals. Medical gentlemen who cultivate this province have usually, perhaps, the human subject too much in their view, and do not always recollect, that to compare one of the lower animals with this, without making a gradual approach to it by the study of the structure of the intervening groups, must

inevitably lead them to erroneous conclusions. When it is recollected that some of the most eminent comparative anatomists have not been professional men, I trust it will stimulate zoologists in general to labour in this field. I beg not to be misunderstood in what I have here stated. I have the highest possible opinion of the medical gentlemen of my country in every branch of their profession; I venerate their skill and science: but the most important duties of their station imperatively call on them to look principally at the human subject: it is not wonderful, therefore, that they should feel disposed to refer all minor forms immediately to that standard.

The zoologist has still other objects, and those of no common interest, that merit his attention. The busy world of animals that *move* around him, does not include the whole circle of his science; there are others that call to him from the *dust*, victims of that mighty catastrophe that once overwhelmed our globe and its inhabitants,—antique forms that have not yet been met with by those “that run to and fro to increase knowledge.” These also, from the giant Mammoth and Megatherium to the most minute grain of an Oolithe, afford a legitimate subject to the zoologist; and amongst our members we number some who have highly distinguished themselves in this vast arena.

To conclude. There is one other and great object which ought to stand first with every Naturalist or Association of Naturalists, the mention of which cannot with any propriety be omitted by *me*, especially upon the natal day of that illustrious Englishman, the father and founder of Natural History in this our country, whose delight it was to celebrate “the Wisdom of God in the Creation:”—that great object is the Glory of the Omnipotent Creator. “*Finis creationis telluris*,” says the immortal Swede, “*est gloria Dei ex opere naturæ per hominem solum*.” We fulfil this great end when we ascribe to him the glory of his works; and more especially when, setting aside, as much as possible, every false bias, our great aim is to discover the *truth* of things, their real nature and relations. And may we all with patient assiduity walk in this path, “and proving all things, may we finally hold fast that which is good!”

ART. II. *Some further Remarks on the Nomenclature of Orthoptera, with a detailed Description of the genus Scaphura. By the Rev. WILLIAM KIRBY, F.R. & L.S. &c.*

GENTLEMEN,

As you were desirous of receiving my remarks on Entomological Nomenclature in time for the last number of your useful Journal, I drew them up in rather more haste than I wished, and the consequence has been that I have fallen into a few errors, which I now take an opportunity of setting right. In the first place, instead of Mr. MacLeay's tribe of *Gryllina*, I ought to have written *Locustina*. I did not also recollect, not finding it in my Hederic, that there was such a Greek word as *Tetrix*, but I have since met with it in Aristotle, who gives it as the name of a bird: ** M. Latreille more than once has applied Aristotle's names of birds certainly improperly, to insects, for instance *Corydalus*, *Oenas*, &c.

It did not occur to me when I alluded to the technical language of anatomy, but I ought certainly to have noticed with honour, Dr. Barclay's *New Anatomical Nomenclature*, in which as far as he has gone he has introduced considerable improvement, and it is to be lamented that his avocations have not permitted him to finish what was so well begun.

I beg leave to add a description more in detail of the characters of the genus *Scaphura*.

SCAPHURA K.

Labrum orbiculatum.*

Mandibulae corneae, validae, subtrigonae, dorso rotundatae, apice dentatae: dentibus tribus primis laniaribus,† intermedio incisivo emarginato,‡ intimo submolari.||

Maxillae lobo superiori coriaceo, lineari, apice incurvo;§ inferiori apice trispinoso; ¶ spinâ inferiori longiori.

** *Hist. Animal.* l. vi. c. 1.

* Plate I. Fig. 1. c. † *Ibid.* Fig. 2. a. ‡ *Ibid.* b. § *Ibid.* c. ¶ *Ibid.* b.

Labium coriaceum apice bipartitum: lobis oblongis.**

Palpi filiformes.

labiales triarticulati: articulo primo sequentibus, intermedio extimo brevioribus.††

maxillares quadriarticulati: articulo secundo et extimo reliquis longioribus, extimo apice incrassato.‡‡

Antennæ multiarticulatæ, basi filiformes apice setacæ.

Ovipositor cymbiformis asper.

Corpus oblongum compressum.

Caput triangulare. *Palpi* hirti. *Antennæ* interoculares, corpore longiores? articulo primo reliquis crassiori, sequentibus novem crassitudine fere æqualibus sed longitudine variantibus, hirtis; tribus proximis sensim tenuioribus, reliquis fere capillaceis. *Oculi* in capitis angulo postico insertis subovalibus prominentibus. *Stemmata* tria opaca, unico ante et duobus pone antennis positis. *Nasus* subtriangulus: angulo verticis rotundato,||| rhinario §§ narium utrinque terminatus.

Truncus. *Prothorax* inæqualis, compressus, trilobus: lobis rotundatis; intermedio horizontali: lateralibus verticalibus.

Tegmina lineari-oblonga. *Pedes* quatuor posteriores angulati: *femoribus* posticis fere claviformibus basi admodum incrassatis, apice valde attenuatis, vix loricatis, tibiis posticis extus longitudinaliter spinosis, intus longitudinaliter calcaratis; ¶¶ *tarsis*, omnibus quadriarticulatis: articulo penultimo bilobo; articulo primo subtus pulvillo duplici, sequentibus duobus unico.

Abdomen femineum undecim constans segmentis; *ovipositori* cymbiformi punctis elevatis acutis aspero.

This genus is distinguished from *Acrida*, not only by its antennæ, filiform at the base, and capillary at the apex, and by its rough cymbiform ovipositor, but in the number of teeth that arm its mandibles, in wanting the remarkable elevation between the antennæ, in having eyes less prominent and of a different shape,

** Plate I. Fig. 5. a. †† Ibid. b. ‡‡ Ibid. Fig. 4. ||| Ibid. Fig. 1. a. §§ Ibid. bb.

¶¶ By a *loricate* thigh is meant one in which there is an appearance of scales, as in certain kinds of armour. I call those *spines* that are *fixed*, and those that are *movable*, *spurs*.

and three distinct, though opaque, stemmata. It approaches near to *Pterophylla* K. the ovipositor being very similar in shape, but much rougher: but its antennæ afford a sufficient diagnostic from that and any existing genus of *Locustina*, MacLeay. It appears to form an osculant group between this tribe as explained above, and the *Grylli* of Fabricius.

Vigorsii.

Long. corp. lin. 14.

Hab. in Brasiliâ. D. Hancock.

Descr. *Corpus* nigrum subpubescens.

Caput. *Mandibulæ* fasciâ rufescenti-pallidâ. *Palpi* articulo penultimo, et extimo basi, subtus pallidis. *Antennæ* ubi filiformes sunt nigræ hirtæ, apice nudæ pallide luteæ. *Elytra* apice pallescentia. *Femora* postica fasciâ mediâ albidâ. *Abdomen* cærulescens.

Tab. I. fig. 6.

In honorem D. Vigers, in Entomologiâ docto, in Ornithologiâ doctissimo nomen imposui.

ART. III. *Observations on the Structure of the throat in the genus Anolis.* By THOMAS BELL, Esq. F.L.S.

THE peculiar structure of the throat in the genus *Anolis*, the anatomical details of which I propose in this Notice to demonstrate, has long been observed by naturalists, as far as regards the external and obvious circumstances connected with it, but has never, that I have been able to ascertain, been examined by dissection; nor has the mechanism been pointed out, by which so curious an effect is produced, as that which they have described.

This genus comprehends such of the Linnean *Lacertæ*, as have long, unequal toes, the penultimate phalanges of which are dilated in such a manner, as to allow of their running with facility upon perpendicular surfaces, by means of a mechanism similar to that which Sir Everard Home has demonstrated as belonging to the foot of the Gecko, and of the Window Fly: namely by the production of a vacuum beneath the foot.* But the peculiarity which forms the subject of this paper consists in the skin of the throat being more or less pendulous, and capable of great expansion, so as to form at the will of the animal, an enormous protuberance, reaching in many species from the anterior part of the lower jaw to nearly the middle of the belly.

This dilatation takes place when the animal is excited by anger or desire. It has been taken for granted by naturalists, judging from mere external appearances, that this remarkable enlargement is produced by *inflation*, and hence various authors who have taken this circumstance as a character of the genus, have adopted terms expressive of such an opinion.† Thus Cuvier says, “la plupart portent un fanon, ou un Goître sous la gorge, qu’ils enflent.” Merrem also gives as one of his characters, “*Corpus inflabile*,” observing, “*Sie können den Rumpf aufblasen*.” “They have the power of *inflating* the belly.” Having lately received numerous specimens of this genus from Madeira, and from the West Indies, I have had an opportunity of making repeated dissections of this part in several species, and of ascertaining the precise mode in which this presumed inflation is produced.

The frame work of this structure consists of a remarkable development of the *os hyoides*, or bone of the tongue. This bone

* A similar structure has been demonstrated in the flippers of the Walrus by the same eminent comparative anatomist; of which an account is given in the present Number of this Journal.

† It is the more remarkable that this error should have obtained, as it is well known that the protuberance beneath the throat in the different species of *Iguana*, is supported by a cartilaginous process of the *os hyoides*; and this is one only of many interesting affinities between these two groups, which I hope to take an early opportunity of illustrating.

is situated immediately under the larynx.* It has two long, slender, bony processes on each side, which for the sake of distinction, I shall term the anterior † and posterior ‡ lateral processes,—a small one, § which is filiform, given off from the anterior part of the bone, and closely connected with the under part of the tongue,—and a very long, delicate, and elastic cartilage, || extending from the body of the bone nearly to the middle of the abdomen, immediately beneath the skin, to the internal surface of which it is attached by condensed cellular tissue. In its form it is slightly flattened and tapering to its extremity, where it is extremely slight and flexible.

The anterior lateral process extends backwards to the angle of the lower jaw, over the muscles of which it is curved upwards. The posterior lateral process is placed in a similar direction, but does not take the same curve over the edge of the jaw. These two processes run parallel to each other through almost their whole length, but at a small distance apart.

There are several pairs of muscles attached to these little bones, by the action of which the phenomena are produced which it is my object to explain. Of these the following are the principal. A broad strong muscle arises from the whole edge of the posterior lateral process, and is inserted into the clavicle. It is consequently of considerable length; and by its contraction the whole bony frame-work is drawn back and a little downwards, so that the distance between the two extremities of the long elastic cartilage being diminished, this organ is thrown into a curve, and the skin of the throat and belly is stretched upon it, exactly as the silk is strained upon the whalebone ribs of an opened umbrella. The parts are restored to their natural state by the action of the following muscles. From the edge of the anterior lateral process arises a muscle which is inserted into nearly the whole length of the base of the lower jaw,—and another taking its origin from the anterior part of the body of the *os hyoides*, is inserted into the symphysis of the jaw or chin. It is obvious that the contraction of these muscles will draw the whole of the little bony frame forwards, and thus restore the whole structure to its usual quiescent

* Pl. II. Fig. 1. a. † Fig. 1. b. ‡ Fig. 1. c. § Fig. 1. d. || Fig. 1. e.

state. These actions are assisted by other muscles of secondary importance, and less readily demonstrated and described; and there are muscular fibres passing from one of the lateral processes to the other through nearly the whole length, which keep them in their proper relative position, and assist in both the actions which I have just described.

I have made the most careful dissections of eight or ten different individuals of various species, but have never been able to discover the slightest ground for supposing that these animals can possibly possess the power of inflating the pouch; nor is there in any part of it the smallest opening through which air could pass.

As my opportunities of observing these lizards have been confined to dead specimens, I am restricted to mere anatomical details: I would however mention that the skin of this part of the throat is always more brightly coloured than that of the rest of the body, and that it is said to be more susceptible of those chameleon-like changes, which many species of this group are capable of assuming, and which are always more vivid during any kind of excitement.

- Plate II. fig. 1. Under view of the os hyoïdes in *Anolis lineatus*.
 2. Side view with the cartilaginous process strait.
 3. The same curved.

ART. IV. *On the utility of preserving facts relative to the habits of Animals, with additions to two Memoirs in "White's Natural History of Selborne."* By W. J. BRODERIP, Esq. F.L.S. &c.

THERE are few facts, however isolated, however trivial they may respectively appear to be, more conducive to the illustration of the history of animals, than those which relate to their habits; and yet there is scarcely any information which is treated in a more careless style. Whether our *amour propre* tempts us to feel that it is beneath us to be the biographers of "rats and mice and such small deer;" or whether the anecdotes which we pick up at

intervals are thrown aside as crude and unconnected materials, the loss is the same. True it is "*non omnes arbusta juvant humilesque myricæ*:" but, if we really have the advancement of natural history at heart, we must, some of us at least, be content to descend from the "*majora*" to more humble details.

It is not one of the least advantages of the periodical publications which are now open to every department of science, that matters, which would scarcely find room elsewhere, and which would, in the absence of some such asylum, be probably lost, are contributed to the general stock of materials. If any one be inclined to keep back his alms from the supposed poverty of the offering, let him remember the widow's mite: the truth is, that no information which throws light on the habits of any animal, however apparently low in the scale of creation, is valueless; while it may be highly important, even when considered with a view to utility, and the effect that such animal may have upon the luxuries, the comforts, nay the very necessities of life.

In the last number of this Journal is recorded the destruction which an army of mice dealt upon whole forests: in their van were the saplings which would have formed the future navies of Great Britain; they marched on, and behind them was desolation.* While one insect defaces the beauty of our parks and woodlands in the South, another lays low the pine plantations of

* The following extract stating the ravages of rats, is taken from a book lately published on Jamaica. As it does not appear that any attempt has yet been made to extirpate these nuisances by the means recommended in the late Lord Glenbervie's paper above alluded to, would it not be worth the Planter's while to resort to the method of digging holes as therein described; taking care to increase their dimensions in proportion to the size of the quadruped whose destruction is intended? In the case mentioned by Lord Glenbervie, the success of this plan, after the failure of every other, appears to have been complete; and W. S. MacLeay, Esq. in the next article (on *Hylobius Abietis*) mentions it as the only means that seemed to answer towards the extirpation of swarms of mice which infested the neighbourhood of Strasburg a few years ago.

"In no country is there a creature so destructive of property as the rat is in Jamaica; their ravages are inconceivable. One year with another, it is supposed that they destroy at least about a twentieth part of the sugar canes throughout the island, amounting to little short of £200,000 currency per annum. The sugar cane is their favourite food; but they also prey upon the Indian corn, on all the fruits that are accessible to them, and on many of the roots. Some idea

the North.* If, after these records, any one should be disposed to sneer at communications such as those, the utility of which I am attempting to advocate, I would say to that man, "if such a man there be"—Read the excellent chapters on the direct and indirect injuries caused by insects, in that storehouse of entomological knowledge the "Introduction," as it is modestly called, of Kirby and Spence;—watch the flight of the Locust and the Hessian Fly, with plenty before them, and famine in their rear;—take, I say, these two plagues alone out of scores of others, and then declare whether a knowledge of their habits, which might teach us to prevent the visitation or stop it in its course, is to be despised.

But there is yet another view of the subject, which a knowledge of the habits of animals most strongly illuminates; a view which will never be deemed unworthy of the attention of philosophical minds. An enquiry into the proper place which different forms hold in the scale of animated beings, can never be prosecuted with success without the aid of light derived from the observations of practical Zoologists.

Few have turned their thoughts to the minutiae of animal habits with such devoted attention as distinguished the late amiable author of "The Natural History of Selborne;" few have watched nature with greater humility and accuracy; and none have recorded their observations in a more perfect style of classical simplicity. He did not think it beneath the dignity of a scholar and divine to be the historian of the habits of the meanest

will be formed of the immense swarms of these destructive animals that infest this island, from the fact that, on a single plantation, thirty thousand were destroyed in one year. Traps of various kinds are set to catch them, poison is resorted to, and terriers and sometimes ferrets are employed, to explore their haunts and root them out; still however their numbers remain undiminished, as far at least as can be judged from the ravages they commit. They are of a much larger size than the European rat, especially that kind of them called by the negroes *racons*. On the experiment being tried of putting one of these and a cat together, the latter declined attacking it."—*Stewart's Jamaica*, page 57, *et seq.*"

* See the valuable papers on *Scolytus destructor* and *Hylebius Abietis*, by W. S. MacLeay, Esq. the first in the 11th vol. of the Edinburgh Philosophical Journal; the second in the first vol. of this Journal.

creature; and, fortunately for us, the naturalists of the day to whom he communicated the results of his labours, valued his letters as they deserved. Actuated by the same spirit, Wilson sought the savannahs, the swamps, and the forests of America, while Le Vaillant penetrated into the deserts of Africa. The former, inspired by the same muse who shed a grace over the narrative of White, has left, in the sweetness of his style, and in the accuracy of his details, a monument which increases the grief always felt at the premature death of a man of genius. The latter, full of years, is gone to "that undiscovered country from whose bourne no traveller returns," leaving to posterity a legacy, which, while it insures their lasting gratitude, gives to him an imperishable name. These men did not content themselves with fireside speculations; they did not conceive that an acquaintance with the treasures of museums would alone enable them to enter the adytum of the temple of nature: No, they sought the goddess in her own woods, and were rewarded with such revelations as no other mode of devotion could have elicited from her. Ask the Zoologist of the present day to whom, of the last generation, he owes the progress which he is making in science, and he will say, without undervaluing the labours of authors of systems, that writers such as these were the spirits who have rendered the veil less impenetrable, "*quique sui memores alios fecere merendo.*"

After the mention of these great names, it may appear presumption in me to venture to contribute any thing in addition to that which one of them has recorded: but, in the hope that others may be induced to throw such observations as they have made into the common stock, I, without further apology, proceed to call the attention of the reader to two letters of Mr. White, forming a part of his "*Natural History of Selborne,*" and to give the additional information which chance or the kindness of friends has thrown in my way.

In a letter to Pennant, dated "*Selborne, 22d Feb. 1770,*" will be found the following extract.

"Hedge-hogs abound in my gardens and fields. The manner in which they eat the roots of the plantain in my grass-walk is very curious.

With their upper mandible, which is much longer than their lower, they bore under the plant, and so eat the root off upwards, leaving the tuft of leaves untouched. In this respect they are serviceable, as they destroy a very troublesome weed; but they deface the walks in some measure by digging little round holes. It appears, by the dung that they drop upon the turf, that beetles are no inconsiderable part of their food. In June last I procured a litter of four or five young hedge-hogs, which appeared to be about five or six days old; they, I find, like puppies, are born blind, and could not see when they came to my hands. No doubt their spines are soft and flexible at the time of their birth, or else the poor dam would have had but a bad time of it in the critical moment of parturition: but it is plain that they soon harden; for these little pigs had such stiff prickles on their backs and sides, as would easily have fetched blood, had they not been handled with caution. Their spines are quite white at this age; and they have little hanging ears, which I do not remember to be discernible in the old ones. They can, in part, at this age, draw their skin down over their faces; but are not able to contract themselves into a ball, as they do for the sake of defence when full grown. The reason, I suppose, is, because the curious muscle that enables the creature to roll itself up in a ball was not then arrived at its full tone and firmness. Hedge-hogs make a deep and warm hybernaculum with leaves and moss, in which they conceal themselves for the winter: but I never could find that they stored in any winter provision, as some quadrupeds certainly do."

So far Mr. White.—It is, now, well known, that these animals eat not only beetles but other insects: many are brought to London by the country people and market gardeners; and purchased for the purpose of destroying the hordes of *Blatta Orientalis* (common cock-roach) which swarm in the kitchens of the city. They are fed occasionally in this their domesticated state with milk, of which they are very fond, but not so unsparingly as to blunt the edge of their appetite for those pests, of which they are the Thalabas. Cuvier, too, who has placed them as the first genus of his twelfth family of Carnassiers (*Les Insectivores*) confirms the suspicion of White as to their insectivorous habits; for he says of the common hedge-hog (*Erinaceus Europæus*) "*aux insectes qui font son regime ordinaire, il mêle les fruits qui lui usent à un certain âge les pointes de ses dents.**"

* Règne Animal, tom. 1. p. 132.

But it is not so well known that, like the Peccaries (*Sus Tajacu*. Lin. *Dicotyles*. Cuv.) these "hedge-pigs" will devour serpents. That they will do so appears from the following interesting communication, for which I am obliged to my friend the Rev. William Buckland, Professor of Geology in the University of Oxford, and President of the Geological Society.

Having occasion to suspect that Hedge-hogs, occasionally at least, preyed on Snakes, the Professor procured a common snake (*coluber natrix*) and also a hedge-hog which had lived in an undomesticated state some time in the Botanic garden at Oxford, where it was not likely to have seen snakes, and put the animals into a box together. The hedge-hog was rolled up at their first meeting: but the snake was in continual motion, creeping round the box as if in order to make its escape. Whether or not it recognized its enemy was not apparent; it did not dart from the hedge-hog, but kept creeping gently round the box; the hedge-hog remained rolled up and did not appear to see the snake. The Professor then laid the hedge-hog on the body of the snake, with that part of the ball where the head and tail meet downwards, and touching it. The snake proceeded to crawl,—the hedge-hog started, opened slightly—and, seeing what was under it, gave the snake a hard bite, and instantly rolled itself up again. It soon opened a second time, repeated the bite, then closed as if for defence; opened carefully a third time, and then inflicted a third bite, by which the back of the snake was broken. This done, the hedge-hog stood by the snake's side, and passed the whole body of the snake successively through its jaws, cracking it, and breaking the bones at intervals of half an inch or more; by which operation the snake was rendered entirely motionless. The hedge-hog then placed itself at the tip of the snake's tail, and began to eat upwards, as one would eat a radish, without intermission, but slowly, till half of the snake was devoured, when the hedge-hog ceased from mere repletion. During the following night the anterior half of the snake was also completely eaten up.

Here we have evidence that the hedge-hog feeds on roots, fruits, insects, and snakes: in fact, that it is an omnivorous animal.

The next memoir which I shall notice, is contained in a letter

to the Honourable Daines Barrington, dated "Selborne, May 9, 1776;" and proceeds thus:

"My friend had a little helpless leveret brought to him, which the servants fed with milk in a spoon, and about the same time his cat kittened, and the young were dispatched and buried. The hare was soon lost, and supposed to be gone the way of most fondlings, to be killed by some dog or cat. However, in about a fortnight, as the master was sitting in his garden in the dusk of the evening, he observed his cat, with tail erect, trotting towards him, and calling with little short inward notes of complacency, such as they use towards their kittens, and something gamboling after, which proved to be the leveret, that the cat had supported with her milk, and continued to support with great affection.

"Thus was a graminivorous animal nurtured by a carnivorous and predaceous one!

"Why so cruel and sanguinary a beast as a cat, of the ferocious genus of *Felis*, the *murium leo*, as Linnæus calls it, should be affected with any tenderness towards an animal which is its natural prey, is not so easy to determine.

"This strange affection was probably occasioned by that desiderium, those tender maternal feelings, which the loss of her kittens had awakened in her breast; and by the complacency and ease she derived to herself from the procuring her teats to be drawn, which were too much distended with milk, till, from habit, she became as much delighted with this foundling as if it had been her real offspring.

"This incident is no bad solution of that strange circumstance which grave historians as well as the poets assert, of exposed children being sometimes nurtured by female wild beasts that probably had lost their young. For it is not one whit more marvellous that Romulus and Remus, in their infant state, should be nursed by a she wolf, than that a poor little sucking leveret should be fostered and cherished by a bloody grimalkin—

----- "viridi fætam Mavortis in antro
Procubuisse lupam: geminos huic ubera circum
Ludere pendentes pueros, et lambere matrem
Impavidos: illam tereti cervice reflexam
Mulcere alternos, et corpora fingere lingua."

Thus far Mr. White.—On the 27th of April, 1820, I saw a Cat giving suck to five young Rats and a Kitten: the rats were about

one third grown. It was diverting to observe the complacency with which the young creatures sucked in the liberal stream which the teats of their foster-mother supplied ; and curious to see the prey cherished by the milk of the destroyer. The cat paid the same maternal attentions to the young rats, in licking them and dressing their fur, as she did to her kitten, notwithstanding the great disparity of size. The man who exhibited this phenomenon in the Strand, near Essex Street, said, that the cat had kittened thirteen days, and, at that time, had three kittens at her teats, when he found this nest of young rats, which seemed a few days old, and turned them in, at night, to the cat for her prey : in the morning he found the kittens sharing the milk of their mother with the rats. Two of the kittens were afterwards destroyed, for fear of exhausting the cat by so numerous a family. The man said the cat was a good mouser ; but admitted that he had taught her to abstain from white mice, which he had been in the habit of keeping.

This is a much stronger case than that mentioned by Mr. White ; for, here, the cat had kittens on which to exercise her maternal tenderness, and which must have sucked sufficiently to prevent any thing like bodily inconvenience. It is hard to account for this perversion of instinct. Is it that, at such times, the all-powerful and uncontrollable *sympathy* is exercised indiscriminately upon every young living creature which is thrown upon the mercy of the new mother for protection and nourishment, and is capable of enjoying her care ? The cases of the Hedge-Sparrow or Wagtail and the young Cuckoo, of young Ducks which are hatched by Hens, and even substituted for their own broods on their loss or failure,—nay, the very assiduity with which a hen will sit upon a ball or two of whitening,—would all seem to point this way ; but I may weary my readers with fruitless conjectures, and cannot conclude better than in the words of Mr. White, who says, at the end of another letter dated March 26, 1773, “ Why the parental feelings of brutes, that usually flow in one most uniform tenor, should sometimes be so extravagantly diverted, I leave to abler philosophers than myself to determine.”

ART. V. *Additional Observations upon a Fossil found in Coal Shale, and the description of a Palate found in Coal, near Leeds.* By J. D C. SOWERBY, Esq. F.L.S. and E. J. GEORGE, Esq. F.L.S.

IN the second number of this Journal,* a figure was given of a Bone, found in Felling Colliery; we were not then aware that a portion of the same fossil had been figured by David Ure, in his history of Rutherglen and Kilbride,† from a specimen found in coal at Stonelaw; he had well observed its vascular structure, and finding it different from that of wood, was induced to say, "From the structure this petrification would appear to belong to the Cane, rather than to the Pine." (p. 304). Mr. Parkes has been so fortunate as to become possessed of the specimen figured by Ure, and has kindly submitted it to our inspection; the appearance of its section confirms us more strongly in our opinion that it is bone, an opinion supported by that of Mr. De la Beche, in the Geological Transactions,‡ where he considers the somewhat similar bones we have alluded to as found in the Lias, "to have been the external defensive radii of some fish, and to have been used in the same manner with similar bones of the Balistes tribe." In a theoretical point of view it is a matter of considerable importance to prove that bones are found imbedded in any of the coal measures: they are certainly very rare; in a practical light they may be esteemed as of still greater consequence, for they will probably serve to identify particular strata of coal at very remote places. From analogy we are led to suppose that these bones belong to *marine* fishes; we are already acquainted with marine shells (*Ammonites Listeri* and *Pecten papyraceus*); it has also been a general opinion that freshwater (perhaps lake) shells are not uncommon in the same formation, such as *Uniones* and *Anodontes*; but independently of the difficulty often experienced in ascertaining the genera of shells from their fossil

* Vol. I. p. 232. t. vii. f. 9.

† Plate XII. f. 6.

‡ Second series, Vol. I. p. 43. with a figure.

remains, a doubt has been thrown upon this opinion by the recent discovery of an Ammonite, several Pectens, and one or two other unquestionably marine shells in a nodule of iron stone, containing also what has hitherto been considered an Anodon; it was found in the Hayne Moor bed of coal, in the Waterloo Colliery, near Leeds, by E. J. George, Esq. F.L.S. The near situation to each other of these marine bones and shells and of the land vegetables, is a very curious fact.

We have now, by permission of the Philosophical and Literary Society of Leeds (to whom the specimen was given by John Field, Esq. of the Low Moor iron works) the pleasure of presenting a figure of a remarkable bony Plate, perhaps a Palate, also found in coal. It is probably only half of the entire bone, for its thickest edge, which measures about one quarter of an inch, presents a fractured surface; this surface shews a cellular structure, characteristic of the soft parts of bones attached to the Palates, Fauces, or Stomachs of Fishes; the tuberculated surface is polished almost like the enamel of teeth, and finishes in a rounded edge, beyond which there is a thin expansion of bone, that served to steady the entire plate in the soft parts into which we may suppose it was once inserted. It is of a dark brown colour, and was imbedded in the pure part of the coal.

We are indebted to E. J. George, Esq. of Leeds, for the following account of its locality. J. D C. S.

THE fossil above described is from the thick coal at Tong, near Leeds, a coal known throughout the northern part of the Yorkshire coal-field as the Beeston Seam. It is a seam of variable thickness, being at Garforth, where it is covered by the unconformable magnesian limestone, 6 feet; at Beeston, 9 feet; and at Tong from 6 to 7 feet.

The seam is divided by partings of white earth (indurated shale) into beds; those at Beeston are three, at Tong two; it is probable that the decrease in thickness from Beeston to Tong, is occasioned by the separation of the lower bed; this has been ascertained to be the case at Churwell, where the lower bed is parted from the upper nine yards.

The distance from this coal to the flagstone which it overlays is about 220 yards; between them are the coals worked at Low Moor, near Bradford, which are accompanied by a great variety of splendid specimens of *Lepidodendra*, of which the Leeds' Philosophical Society possesses many fine specimens.

The respective distance of these coals above the flagstone, are, from the flagstone to the Low Moor lower Seam 100 yards, above which the next coal is the Low Moor upper Seam (there called the Black Bed) 40 yards, which is succeeded by the Beeston Seam, at 80 yards; above the Beeston Seam, the next workable coal is the Middleton Lower Seam, at 90 yards.

The fossils contained in the strata of the Beeston Seam are not much known, since from the thickness of the coal the shale is not worked.

E. J. GEORGE.

2 2
Description of the Figure. Plate I. fig. 7.

- a. a.* The enamel-like surface.
 - b. b.* The fractured edge, with some slight signs of a suture.
 - c. c.* Bony expansion as thin as card-paper.
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ART. VI. *Notice of the Occurrence of some rare British Birds.* By WILLIAM YARRELL, Esq.

[To the Conductors of the Zoological Journal.]

GENTLEMEN,

SHOULD you consider the following account of the occurrence of some rare British Birds sufficiently interesting to be worthy of insertion in your valuable Journal, it is much at your service. The circumstances stated have come within my own knowledge, and many of the specimens referred to are in my possession.

1823. *January.* A female of the Little Bustard (*Otis tetrax*) was shot near Harwich. The stomach contained parts of leaves of the white turnip, lungwort, dandelion and a few blades of

grass. The flesh had not the delicacy of appearance or flavour which it is described by some authors to possess.

November. A specimen of the Petrel, named after Dr. Leach, (*Procellaria Leachii*), was brought to the London market alive; it died on the evening of the same day. The month of December following produced two other specimens, one killed in Devonshire, the second in Hertfordshire.

1824. *July.* A female of the Long-legged Plover (*Charadrius himantopus*), was sent to the London market from Lincolnshire; and about the same time, a very fine male bird was shot in Norfolk; in the intestines of this male bird was a species of tape worm, six inches in length, broad, flat and jointed.

A male and female of the Pigmy Curlew (*Numenius pygmaeus*) were shot in Norfolk, exhibiting the perfect summer plumage.

1824. *August.* A very fine old male of the Pigmy Curlew with two young birds of the year, was shot in Huntingdonshire.

September. A young Arctic Gull (*Lestris parasiticus*) was shot on the Thames near Battersea.

November. During the first week of this month a beautiful specimen of the Grey Phalarope (*Phalaropus lobatus*), was shot while swimming on the Thames near Battersea. It proved to be an old female having nearly completed its winter plumage, but still bearing sufficient marks of its summer dress to form an interesting state of change. The contents of the stomach were too far digested to ascertain the quality.

More than a dozen Stormy Petrels (*Procellaria pelagica*) were procured, on the Eastern Coast principally, during the remarkable windy weather that occurred this month. One bird was shot from a coal barge while flying about over the Thames between the bridges of Blackfriars and Westminster.

Two Pigmy Curlews, birds of the year, and several Sanderlings (*Charadrius calidris*), in complete winter plumage, were brought to London market. The Rough-legged Falcon (*Falco lagopus*, L.) occurred three or four times in this month, one of which, a female, was shot in the Isle of Wight: a second, a female also, was caught by a trap in Gloucestershire. The bony ring in which the orb of the

eye is suspended in this species is particularly large and strong. This flexible ring formed by a number of small bones was considered to be peculiar only to the diurnal and nocturnal birds of prey; the increased power of vision, at very different distances, depending on minute muscular and mechanical arrangements, assisting them in their search for objects of food: but in occasional examinations of birds, I have found these bony rings in the Green Woodpecker, the Great Plover, the Grey Phalarope and the Northern Diver, as well as in many other birds equally varied in form and habits. The most remarkable of the bony rings I have yet seen is in the Wood Owl (*Strix Stridula*) corresponding very closely in form to the watchmaker's eye-glass.

The Osprey (*Falco Haliaetus*,) occurred twice in this month; one, a very fine male, was shot near Petersfield, Hants, the other, a female, in Hertfordshire.

A female of the Skua Gull (*Lestris Catarractes*,) was killed in Somersetshire.

December. Two specimens of the Northern Diver (*Colymbus glacialis*,) both young birds, were shot on the Norfolk coast. The London market produced four spotted Redshanks, (the *Scolopax Totanus* of Gmelin, the *Totanus fuscus* of Leister); these birds were in perfect winter plumage, and considered rare. The figure in Bewick's beautiful engravings is an exact representation of a young bird of the year.

1825. *January.* Three or four specimens of the Ash-coloured Shrike (*Lanius Excubitor*,) occurred this month; one was shot in Hampshire, a second in Bedfordshire, and a third was taken in a clap-net, near London, by a bird-catcher, in the act of striking at his decoy linnet. This bird fed well in confinement several days, taking small birds or raw meat from the hand, but was very eagerly parted with by his new master, on finding that the note of the Shrike, once heard, had stopped the songs of all his wild birds.

The Hawfinch (*Loxia Coccothraustes*, L.) was shot near Notting Hill on the Uxbridge Road, and two others were taken by a party Batfowling.

February. The Little Auk (*Alca Alle*, L.) was shot on the coast of Sussex.

March. The Little Stint (*Tringa pusilla*,) was shot near St. Ives, in Huntingdonshire.

I have the honor to be,

Gentlemen,

Ryder Street, St. James's,
12th MARCH, 1825.

Your obedient Servant,
WILLIAM YARRELL.

ART. VII. *Descriptions of some new and rare Volutes.*
By W. J. BRODERIP, Esq. F.L.S. &c.

IN the fifth number of the Westminster Review, the writer, while administering a course of castigation in the case of the Rev. T. F. Dibdin and others, who are affected by Bibliomania, takes occasion, *en passant*, to give a *coup de patte* to collectors in general. "We are always doubtful and suspicious," says the reviewer, "of the real information possessed by collectors of books, minerals, shells, or any other materials and sources of science; and we have uniformly found that, in proportion as the rage for collecting gained strength, the inclination and subsequently, as well as consequently, the ability to profit by what was collected, diminished."

I have not a word to say with regard to the noblemen and gentlemen of the Roxburghe Club. They would hardly accept of a precarious defence from one of the uninitiated; and there is more than one of their own body well qualified to lead a battle of the books. Confining myself, therefore, almost exclusively, to British collectors of Zoological subjects, and leaving all other collectors of all other materials to be their own champions, I shall refer to a few names of the present day, which the omniscience of the reviewer seems to have overlooked.

The authors of *Horæ Entomologicæ* and *Reliquiæ Diluvianæ*, books containing the results of more industry of research and depth of thought than most works hitherto published on the subject of Natural History, are most ardent collectors; and they continue almost daily to give us the practical and philosophical bene-

fits of their zealous labours. A host of others who have made and are making rapid strides into the inmost recesses of the animal kingdom, or have contributed from their stores materials which shed an additional light on the path of their fellow labourers, will be found in the list of collectors.* For the best natural arrangement of shells hitherto published we must look abroad: but we shall find that we owe this arrangement to a collector; and, whenever we come to any very rare or interesting species in the pages of Lamarck, we are almost sure to find thereunder written "*mon cabinet*."

It would be idle to waste time in multiplying instances: indeed, if we consider for a moment, we shall not find it extraordinary that so large a catalogue of names can be readily quoted against the reviewer. What is it that spurs on the man employed in zoological pursuits to make a collection of the objects of his study, objects which, in many cases, are the fruit either of painful and patient research, or costly price? The many will answer—vanity. "Is it answered?" I say nay. Such a collector may, indeed, be proud of the museum which his zeal and activity have succeeded in forming, and justly; but vanity is not the motive which incites him to collect. What then is the motive?—It is necessity: he cannot report progress without having materials for study. In the existing state of the public zoological collections of England, he cannot calculate upon their never-failing resources: and, though a spirit is abroad which leads the naturalist, whether in the metropolis or in the great country towns, to hope that future students will begin their labours with a prospect of better days, he must, at present, either stand still, or trust to his own collections and those of his friends.

There is, however, it must be confessed, a species of collector,

* The following names, together with many others of merit, will occur to almost every one conversant with Zoology. Bell, Bennett, Brookes, Burchell, Children, Clift, Conybeare, Curtis, De la Beche, Dillwyn, Donovan, Fleming, Goodall, Gray, Hardwicke, Haworth, Home, Horsfield, Humphrey, King, Kirby, König, Laskey, Latham, Leach, MacLeay, Maton, Mawe, Miller, Rackett, Raffles, Sabine, Samouelle, Selby, Sowerby, Spence, Stanley, Stephens, Stokes, Such, Swainson, Traill, Turton, Vigors.

now become *very rare*, the only species with which the reviewer appears to have come in contact, deserving of all his "doubts." Such is the mere hoarder who spreads his hidden treasures before him solely for the pleasure of his eye, or the gratification of his vanity; whose pursuit, even if his avarice of natural productions can be pronounced quite harmless, is about as intellectual and useful as that of the northern prince, who used to amuse himself with arranging his jewels on a table covered with black velvet, in every figure which his second childishness could suggest.

It is the bounden duty of the collector of shells more especially, to put off these childish things. In conchology, although such men as Adanson, Poli, Cuvier, and Lamarck have lent their aid to the science, there is more to be done than there is in any other department. The Ornithologist and Entomologist have, in almost all cases, a complete form to deal with, combined, generally, with a knowledge of the habits of the animals, which form the subjects of their studies. The Conchologist is surrounded by difficulties. The animals, with which he should be conversant, reside, in the majority of instances, in the bosom of the great deep; and the shells, which come to his hands ninety-nine times out of a hundred without the inhabitants, are mere exuvix, whose purposes in the animal economy he is left to conjecture. Too many of the writers on this subject have never bestowed a thought on the matter, and consequently we are presented with the most unnatural arrangements, the result of placing the *testacea* solely according to the form of this part of their organization, without considering the probable structure of the more vital parts of the animal and their relation to the figure of the shell; "for we have annulose animals united to true mollusca, merely because they have shells, and true mollusca separated from this division, merely because they have no shells."*

With such obstacles in the way of our progress, it is almost unpardonable if we do not avail ourselves of the contents of our collections to aid the fund of scanty materials with which we

* *Horæ Entomologica*, p. 242. The shell collector will find many useful hints in the neighbourhood of the passage quoted.

have to toil on towards a natural arrangement. And let us not be discouraged because we cannot afford the most satisfactory details. Till we can obtain a more complete knowledge of the inhabiting animals, we may contribute such information as is to be derived from a careful examination of their exuvix with a view to their probable structure; in the hope that every addition may, at least, assist the Geologist, and perhaps form a step, however small, for the advance of natural science.

Under the impression that no communication of this kind will be considered devoid of interest, and anxious to contribute any aid however feeble, which my own stores enable me to offer, I proceed to give the following descriptions.

VOLUTA RUTILA.—Red-banded Volute.

V. testâ ovato-oblongâ, rufescente, maculis subtrigonis, confluentibus, croceo-rubris variâ; spirâ brevi, suturâ simplici; apice papillari, subgranulato: anfractu basali tuberculis elongatis armato fascisque 2 latis, interruptis, rutilis, ornato; columellâ 4-plicatâ.

var. Anfractu basali inermi.

Mus. nost. Habitat in Ocean. Austral?

Icon. Tab. III.

Shell ovate-oblong, reddish or flesh-coloured, covered thickly with confluent, subtrigonal reticulations of a saffron red. The spire short, its suture unarmed, the apex papillary and slightly granulated or beaded. The body-whorl armed with elongated tubercles, ornamented with two broad interrupted bands of a deeper and more vivid red, and with oblique irregular stripes of the same colour, extending from the suture to the tubercles in the tuberculated variety, and from the suture to the shoulder of the body whorl in the smooth variety. Pillar four-plaited, the two lowest plaits rather largest. Length about three inches.

This beautiful volute was received from a South Sea whaler by Mrs. Mawe, who could not learn from the possessor of it the name of the place where it was found. There were brought at the same time and by the same hand three others; but they had

all suffered so much by the *auto da fé* which they had undergone for the purpose of roasting the inhabiting animals, that the greater part of each shell was fairly burnt into lime. My specimen with the tuberculated body-whorl has suffered but very little; and, with the exception of a paleness where it has come in contact with the fire, is brilliant in colour. The beauty of the specimen with the smooth body-whorl has entirely yielded to the unmerciful calcination bestowed on it; but fortunately, no injury has been done to the spire or to the form of the shell.

The case of a variety with a smooth body-whorl is by no means uncommon among the tuberculated *Volutæ*. I have very striking examples of it in *V. nivosæ* and *V. Lapponica*, as well as in *V. rutila*;—to say nothing of *V. vespertilio*, Lin.

V. rutila appears to me to form an addition to that small natural group of *Volutes* which have the last turns, forming the papillary summit of their spire, beaded with a series of regular, minute granulations or pustules. This group contains, together with *V. rutila* and *V. pulchra*, *V. magnifica*, Chemn. and Lam.; the bats (*V. vespertilio*, Lin. and Lam.; *V. pellis serpentis*, *V. mitis*, and *V. serpentina*, Lam.);* and *V. nivosæ*. The granulations are most developed in *V. vespertilio* and *V. nivosæ*; and are least perceptible in *V. magnifica*. It may be worthy of notice that all these shells have four plaits on the pillar, and that Lamarck records the South Seas as the habitat, though not exclusively, of the last six, with the exception of his *V. pellis serpentis*, and *V. serpentina*, to which he gives as a locality "*L'Océan des Grandes Indes*." I strongly suspect that these last are also natives of the South Seas; and, indeed, I have some strong evidence towards the confirmation of these suspicions: but the locality of Testacea, or indeed of any animals or natural productions, is a point of such high importance, as connected with their geographical distribution, that the utmost caution should be used before we come to a conclusion on this head.

* After a careful examination of a connecting series of specimens, I am unable to discover any satisfactory specific distinction either in *V. pellis serpentis*, in *V. mitis*, or *V. serpentina*, Lam.: nor do I think that any sufficient cause exists for removing them from the situation which they formerly occupied as varieties of *V. vespertilio*, Lin.

As soon as I became possessed of my specimens of *V. rutila*, I carried the tuberculated variety to Mr. George Humphrey. It is well known that this patriarch of collectors has been most assiduous and accurate in noting down localities. When he saw the shell, he pronounced it undescribed and not the *V. aulica* of Solander; and an examination of the MSS. of that eminent naturalist will prove the correctness of Mr. Humphrey's assertion.* He said that it was extremely rare, that he had a small one in his own collection, and that, from the place whence he received it, he called it the Red Music of New Zealand. This specimen, which is of the tuberculated variety, has now passed, together with the rest of the collection accumulated by Mr. Humphrey, during a life already extended beyond the ordinary bounds allotted to man, into the hands of Mr. G. B. Sowerby.

VOLUTA PULCHRA.—The Beauty Volute.

V. testâ oblongo-ovată, subfusiformi, lævi, nitidâ, carneâ, albido-maculatâ, maculis spadiceis triseriatim irregulariter dispositis, ornatâ; anfractibus supernè adpressis, tuberculis acutiusculis, sub-compressis, coronatis: aperturâ supernè acutâ, columellâ 4-plicatâ. Long. $2\frac{4}{10}$. lat. $\frac{1}{10}$ unc. *Sowerby in T. C.*

V. testâ oblongo-ovată, subfusiformi, lævi, carneâ, niveo-maculatâ; anfractu basali maculis fusco-spadiceis, sparsis, trifasciato; anfractibus angulatis, tuberculisque elongatis, anticè acutiusculis, frequentibus, coronatis; spirâ mediocri, apice sub-papillari, sub-granulato; columellâ 4-plicatâ.

Mus. nost.

Habitat.

Icon. T. C. tab. 3. f. 2.

Shell ovate-oblong, subfusiform, smooth, of a flesh-colour spotted with snowy white; the whorls angulated and armed with elongated tubercles nearly sharp at the anterior extremity, where they are so much elevated as to make an almost abrupt descent to the suture; the body-whorl ornamented with three bands of irregular dark-chestnut spots on a ground somewhat darker than the

* See next page.

rest of the shell,—the uppermost of these bands wreaths the coronet of tubercles; spire moderate, the apex sub-papillary and somewhat granulated; pillar 4-plaited. Length 2 inches 4 tenths.

This elegant shell, one of the gems of the Tankerville collection, in the catalogue of which it is first named and described by Mr. G. B. Sowerby, is the most slender which I have yet seen with the granulated apex. The tuberculated whorls gradually lose themselves in granulations, and these last terminate in the subgranulations of the apex, which, though still papillary, is much more acuminate than in any other species composing the group.

Its colouring, particularly in its snow-spots, reminds us of *V. nivosa*; while its form, as Mr. Sowerby observes, approaches that of some of the elongated varieties of *V. vespertilio*. It appears to me with its sub-granulated apex, tuberculated whorls, sub-fusiform shape, and somewhat produced spire, to lead us towards those fusiform *Volutæ* which have the spire very much produced, such, for instance, as *V. Pacifica* (Chemn.), and *V. gracilis* (Swainson), while the granulations are strongly marked on their attenuated spire, even up to the papilla or apex, which, however, is quite smooth.

If my recollection is right I have seen a second specimen of this shell in the collection of Mr. Spurrett. I never saw or heard of any others. Of its locality I am ignorant: my strong suspicions point to the South Seas.

VOLUTA AULICA.—*Courtier or Ruddy-cloud Volute*.

(*Spira apice mamillari*).

Voluta emarginata oblonga inermis albo luteoque nebulosa, spirâ conicâ: anfractibus obliquè planis: mamillâ lævi; columella quadriplicatâ.—*Solander's MSS.*

V. testâ oblongâ, inermi, albo luteoque nebulosâ; spirâ conicâ, brevî, apice mamillari, lævi; columellâ 4-plicatâ; labii exterioris margine in spiræ anfractum ultimum ascendente.

Mus. nost.

Habitat.—?

Icon. T. C. tab. 6.

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Shell oblong, unarmed, beautifully clouded with white, yellowish red and flesh colour; spire conical, short, the mamillary apex smooth; pillar 4-plaited; the middle of the basal belt, arising between the two upper parts of the pillar, marked by an elevated somewhat granulated line, which becomes depressed as it approaches externally the great basal notch; * margin of the exterior lip ascending upon the last whorl of the spire. Length about 4 inches.

Through the kindness of Mr. Brown, I was enabled to communicate to Mr. G. B. Sowerby, Dr. Solander's description of this beautiful shell; and it is, accordingly, published in the catalogue of the Tankerville collection, of which *Thesaurus conchyliorum V. aulica* formed one of the brightest ornaments. The Doctor's manuscript has at the bottom "Habitat in Oceano I." but the last initial is written with apparent hesitation, and so as to be hardly legible. I do not, therefore, feel warranted in giving the Indian Ocean as its locality, more especially when this uncertainty is connected with what follows. In the margin of the M.S. will be found the initials M.C.P. being Dr. Solander's reference to the Portland Museum, in the formation of the catalogue of which he is known to have materially assisted. At lot 4021 of the catalogue will be found the following description—"A very fine specimen of *Voluta Aulica*, S., a beautiful red clouded species of the Wild Music kind, its country unknown, *unique*." This lot is referred to in the catalogue of Monsieur de Calonne's museum, drawn up by Mr. G. Humphrey, thus "273. *Aulica*—*Le Courtisan ou le nuage rouge*—Courtier or red-clouded—*Voluta Aulica Soland.* This beautiful shell is *unique*. Its country is unknown, but presumed to be from some newly-discovered island in the South-seas. M.P. 4021."

* The line is so distinct in this rare shell that it was thought advisable not to omit the mention of it. But we must be careful not to rely on it as a specific character; for its presence or absence in different subjects of the same species of *Volutes*, seems to be almost matter of accident. That this belt is divided in many species by a line sometimes elevated, sometimes depressed, and sometimes nearly obsolete, will be seen by every accurate observer. There must be, therefore, some corresponding formation in the molluscum.

The shell mentioned in these catalogues, I believe, with Mr. Sowerby, to be the identical specimen which furnishes our description.

It appears to me to have for its congeners those volutes among which the mamilla of the spire and the columellar plaits are most strongly developed, the former being well fashioned, smooth, and comparatively broad and flat at the apex, and the latter particularly well defined and highly raised from the pillar. These shells, too, have the basal belt very strongly marked, and generally taking its rise, in the best developed forms, between the first two plaits of the pillar, which plaits form the boundary of its width at its origin. *V. scapha* will readily occur to every collector, as an example of these volutes.

The basal belt seems to be of some consequence in the animal economy, and it may, therefore, occasionally furnish us with some useful hints. It is continued from the point of its origin on the pillar, gradually increasing in width as it advances, till it arrives at the great basal notch which it receives, and is evidently formed by a succession of growths, each of which in its time appears to have terminated in the basal notch. In the group containing *V. vesperilio*, this belt, which is least developed in *V. pulchra*, will be found also to take its rise between the two first plaits of the columella. In *V. magnifica* it is very much developed, while the granulations of the well formed mamillary spire of that shell are becoming indistinct. In *V. aulica* the belt is very remarkable, while the well formed mamilla is quite smooth.

I cannot help thinking, upon the whole, that when we have full materials for a natural arrangement, *V. aulica* will be found to approach the granulated group by a near vicinity to *V. magnifica*.

VOLUTA FULGETRUM.—*Lightning-flash Volute*.

V. testâ oblongâ, lævi, spirâ acuminatâ, apice papillosâ, lævi; pallidè carneâ, spadiceo anguloso-striatâ (quasi fulguratâ), anfractu ultimo ventricosò, supernè subangulato; aperturâ oblongâ supernè acutâ, labio columellari tenui, expansissimo; columellâ tripliatâ. Long. 6. lat. 3. unc.—Sowerby, in T.C.

V. testâ oblongâ, ventricosâ, lævi, inermi, pallidè carneâ, strigis

flammiiferis, enormiter angulosis, fusco-spadiceis, ornatâ ; anfractu basali supernè angulato, cæteris gibbis ; spirâ productioni, apice truncato-papilloso ; columellâ triplicatâ ; labio exteriore sub-reflexo.

Mus. nost.

Habitat.—?

Icon. T.C. tab. 4 & 5.

Shell oblong, ventricose, smooth, unarmed, pale flesh-colour, painted with wildly irregular angulose flamy stripes of dark chestnut ; body whorl angulated above, the other whorls gibbous ; spire rather produced, its apex truncato-papillose ; pillar with three plaits ; margin of the outer lip somewhat reflected. Length about six inches.

This very fine and extraordinary volute, first described and figured in the Tankerville Catalogue, strikes us at once by the singularity of its form and the boldness of its colouring. The apex of the spire, fashioned after the same manner as that of *V. papillosa* (Swainson), in which shell this peculiar structure is most strongly developed, gives us the idea of a papillary apex which has been rubbed or cut down, or abruptly terminated before the papilla was complete. To designate this kind of apex I have used the term "truncato-papillose." The same formation, but upon a smaller scale, will be found in the apex of *V. fusiformis* (Swainson). All these shells have three plaits on the pillar, and the outer lip more or less reflected.

I have no direct evidence of its locality, but its congeners were found in the Southern Ocean ; and I suspect that our shell, the only specimen which I have seen or heard of, is a native of the the same seas.*

* I take this opportunity of announcing my intention to attempt a monograph of the genus *Voluta* of Lamarck.

ART. VIII. *Sketches in Ornithology; or Observations on the leading Affinities of some of the more extensive groups of Birds.* By N. A. VIGORS, jun. Esq. M.A. F.L.S.

[Continued from Vol. I. p. 446.]

ON A GROUP OF PSITTACIDÆ KNOWN TO THE ANCIENTS.

ALTHOUGH, in a scientific point of view, the value of any subject of Natural History is little enhanced by the consideration of its having been known to the ancients, yet the researches which have tended to elucidate such groups of Nature as have met with their regard or attention have not been altogether unproductive of advantage. We cannot expect, it is true, that ancient science, limited as were the means of investigation which it possessed, and scanty as are the relicks relating to it which have survived the ravages of time, can add much to the stock of modern information on such subjects; yet on the other hand, the application of modern science to classical literature amply confers that benefit which it may not derive in return, in bringing to light many beauties, and clearing up many obscurities in the pages of antiquity.

But there is another point of view in which the interest of such researches is strongly apparent. In general we are acquainted with the ancients chiefly through the records of their most splendid actions. The dignity of history and the elevation of poetry to which we are almost exclusively indebted for our knowledge of ancient manners, confine the representations which are transmitted to us of them, for the most part, to those which are most important and heroick. We are presented with little beyond the achievements or the apothegms of the warrior, the statesman, or the philosopher. All the minour occurrences of domestick life, all the more endearing traits of private feeling, are cast into the shade. We see the ancients almost always in full dress, almost always in the stately attitudes, and on the exalted pedestals of life. It is only by scattered references that we are enabled to enter into their homes and their bosoms, and investigate the

most attractive of all subjects, the windings and variations of the human heart. Natural History affords us an occasional insight into feelings of this nature. Through its means we possess a subject of common interest, by which we find ourselves, as it were, on familiar terms with those who are removed from us not merely by time, but by that imposing dignity which time never fails to confer. When our feelings are called forth in admiration of a bird or an insect, which is known to have equally excited the admiration of an Alexander or an Aristotle, we become almost unconscious of the lapse of time, which has separated us from such characters; we feel ourselves attracted to them by a community of sentiment; and rejoice in that sympathy which brings us in contact with the patron of science and the man of genius of the days that have gone by. Science, it is said, levels all distinctions of rank and station, and unites all the adventitious differences in society under the powerful influence of genius and of knowledge: but science goes still farther in the present case, for it appears to level all the distinctions of time and space. In pursuing such researches into antiquity we find not merely that external nature was the same two thousand years ago as it is at present, but that human nature itself has undergone but little variation. I scarcely know a description on which we can dwell with sentiments of more unalloyed satisfaction,—not merely from its intrinsic beauty, but from the exhibition of genuine tenderness of heart, which is thus proved to be the property of no time or climate, but to be common to all,—than the recognition of his master by the faithful Argus, in the following passage of the “Odyssey,” and the depth of feeling betrayed on the occasion by the “much-enduring” prince.

“ Ἀν δὲ κυὼν κεφαλὴν τε καὶ οὐρὰ κειμένος ἔσχει
 Ἀργὸς Ὀδυσσεύος ταλασίφρονος, ὃν ἔα ποτ' αὐτὸς
 Θρῆψε μιν, οὐδ' ἀπονητό·——
 Ἐνθα κυὼν κῆϊτ' Ἀργός,——
 Δὴ τότε γ', ὥς ἐνόησεν Ὀδυσσεύς ἐγγυς εἶντα,
 Οὐρῇ μιν ῥ' ὄγ' ἔσθιε, καὶ οὐρὰ καββαλεν ἀμφῷ·
 Ἀσσοὶ δ' οὐκ ἔτ' ἐπιπτα δυνήσατο οἷο ἀγκυρὸς

Ελθὺμεν* αὐτὰρ ὁ ΝΟΣΦΙΝ ΙΔΩΝ ΑΠΟΜΟΡΞΑΤΟ ΔΑΚΡΥ,
ΡΕΙΛΑ ΛΑΘΩΝ Εὐμαχιον.—

Ἀργον δ' αὖ κατὰ μοῖρ' ἔλαβεν μέλανος θανάτοιο,
Λυτικ' ἰδὼντ' Ὀδυσῆα μεκαστῇ ἐνίαυτῳ."*

Odyss. XVII. 292—337.

Nor can I conceive any representation touched with more genuine delicacy and truth of feeling than the poet's description of Lesbia's favourite bird, and lamentation for its loss; a picture, which he brings home to our eyes, and identifies with the scenes that every day pass around us.

" *Passer, deliciæ meæ puellæ,
Quicum ludere, quem in sinu tenere,
Quoi primum digitum dare adpetenti,
Et acris solet incitare morsus;—
Passer mortuus est meæ puellæ:—
Quem plus illa oculis suis amabat:
Nam mellitus erat, suamque norat
Ipsam tam bene, quam puella matrem;
Nec sese a gremio illius movebat;*

- * " Thus near the gates conferring as they drew,
Argus, the dog, his ancient master knew;
He, not unconscious of his voice and tread,
Lifts to the sound his ear, and rears his head;
Bred by Ulysses, nourished at his board;
But, ah! not fated long to please his lord!—
Now left to man's ingratitude he lay,
Unhoused, neglected in the publick way.—
He knew his lord; he knew, and strove to meet;
In vain he strove to crawl, and kiss his feet;
Yet—all he could—his tail, his ears, his eyes,
Salute his master, and confess his joys.
Soft pity touched the mighty master's soul;
Adown his cheek a tear unbidden stole,
Stole unperceived; he turned his head, and dried
The drop humane.—
The dog, whom fate had granted to behold
His lord, when twenty tedious years had rolled,
Takes a last look, and having seen him, dies.—"

Pope. Odyss. B. 17. v. 345—398.

*Sed circumsiliens modo huc, modo illuc,
Ad solam dominam usque pipilabat.**

Catull. Carm. II.—III.

While the tears and swoln eyes of its mistress—

“Flendo turgiduli rubent ocelli—”

bear testimony that the female heart was not made of “sterner stuff” in the days of old than in the present, but that equally susceptible of regard for the little favourites that looked up to it for support and protection, as in the most refined of modern times, it could equally lament

“The squirrel missing, or the sparrow flown.”

Among the subjects connected with Natural History, which, like the preceding, are either incidentally referred to by the classick writers, or expressly described, I have been particularly attracted by a group which claimed a high regard with antiquity,—the *Parrots* of the ancients. Those who are conversant with the better times of Greece and Rome, or rather of the latter empire, for it was at a late period of the Grecian annals that *Parrots* became known, are aware that these birds, from their beauty, their docile manners, and the imitative powers†

* The beauty of these verses of Catullus seems not to have been lost on the Romans themselves. They appear to have been popular among them, and to have been referred to as we would allude to our Shakespeare or Byron. See particularly Martial. Lib. I. Epig. de Catellâ Publi.

*“Issa est passere nequior Catulli,
Issa est purior osculo columbæ.”*

† The powers of voice and of imitation belonging to these birds could not be passed over by those to whom they appear to have been so familiar. Aristotle accounts for these powers as the consequence of the formation of their tongue which approaches that of man. “Ὅλως δὲ γαμψωνυχα πάντα βεατρεαχίλα καὶ πλατυγλωττα καὶ μιμητικά· καὶ γὰρ τὸ Ἰνδικὸν ὄρνις, ἡ ψιττακὴ τὸ λεγόμενον ἀνδρωπογλωττοῦ, τοιοῦτοί εἰσι.” Hist. Anim. VIII. 14. 6. Solinus apparently following Aristotle makes the same allusion—“lingua lata, multoque latior quam cæteris avibus. Unde perficitur ut articlata verba penitus cingatur. Quod ingenium ita Romanæ delitiæ miratæ sunt, ut Barbari

of their voice, were in general request and estimation:—that they were the favourites of some of the highest personages of

Psittacos mercem fecerint." Polyhist. c. 23. p. 121. Ed. Ald. 1518. Apuleius refers to the same formation of the tongue as the cause of the same powers of speech. "Verum ad disciplinam humani sermonis facilius est psittacus, glande qui vescitur;—illud omnibus proprium, quo eis lingua latior, quam cæteris avibus, eo facilius verba hominis articulantur patentiore plectro et palato. Id vero quod dicit, ita similiter nobis canit, vel potius eloquitur, ut vocem si audias, hominem putes." Florid. Lib. II. p. 137. Ed. Ald. 1521.

In fact these birds are seldom mentioned by classick writers without a reference to their voice. Arrian expressly alludes to it. "*Νεαρχος αφηγγεται—*

ὅπως οὖν ἐστιν ὁ σιττακος, καὶ ὅπως φωνῇ ἰσι ἀνδρωπῶνιν." Hist. Ind. c. xv.

Plutarch, in one of those treatises which prove him to have been no ordinary observer of nature, (see particularly his Treatises "De Amore Proles," and "De Solertiâ Animallum," Vol. VII. and X.) equally refers to the powers of voice which these birds possess in common with the *Stares*, and *Pies*.

"*Ἦρως δὲ καὶ κορακίς καὶ ψιττακοὶ μάθαντες διαλεγέσθαι, καὶ τὸ τῆς φωνῆς πνεῦμα τοῖς διδασκῆσιν εὐπλάστον ὥτ' αὐ καὶ μῦθον ἐξαριθμεῖν καὶ ἐκδιμῆσαι παρεχόμεναι, ἐμοὶ δοκῶσι προδικεῖν καὶ συνηγορεῖν τοῖς ἄλλοις ζῴοις ἢ τῷ μαιδανῷ, τρόπον τινὰ διδασκόντες ἡμᾶς, ὅτι καὶ προφορικῇ λόγῳ καὶ φωνῇ ἐπαρξέσθαι μετισθῶν αὐτοῖς.*" De Solertiâ Anim. Opera. Vol. X. p. 51.

Ed. Reiske. The poets abound in passages equally descriptive of their powers of speech.

"Quid tamen ista fides? quid rari forma coloris?

Quid vox mutandis ingeniosa sonis?—

Nou fuit in terris vocum simulacior ales;

Reddebas blæso tam bene verba sono;—

Occidit ille loquax, humanæ vocis imago,

Psittacus, extremo munus ab orbe datum."

Ovid. Amor. L. II. El. VI.

"Psittacæ dux volucrum, domini sacunda voluptas,

Humanæ solers imitator Psittacæ linguæ;—

Ille saluator regum, nomenque locutus

Cæsareum, et queruli quondam vice functus amici,

Nunc conviva levis, monstrataque reddere verba

Tam facilis: quo tu, Melior dilecte, recluso

Nunquam solus eras."

Stat. Syl. L. II.

The name of *Cæsar* seems to have been the favourite word, which was taught to these "salutatores regum," and in former times to have occupied the place of those trivial and unmeaning phrases which are in the mouths of our modern *Parrots*. The delicate flattery of the Roman epigrammatist is conspicuous in the following lines.

those times,* were honoured by the attention of some of the chief men of science, and were immortalized by the genius of some of

“ Paittacus a vobis aliorum nomina discam,
Hoc didici per me dicere, Cæsar ave.”

Martial. Epig. Lib. XIV.

We may adduce the following passage from the “ Anthology” as illustrative of the lessons which were given to these birds.

“ Ψιττακος ὁ βροτογενὴς ἀφ' οὗ λυγροτευχὴ κέρτων,
Ἡλυθεν εἰς δρυμοὺς ἀνδοφρεὶ πτερυγι.
Αἰεὶ δ' ἐκμιλιτῆν ἀσπασμασι Κᾶϊταρα κλεινον,
Οὐδ' ἂν ὤσῃ λήθην ἡγαγὶν νομοτατος.
Ἐδρεμὲ δ' ἀκιδιδακτος ἅπας ὠϊντος, κρίζων
Τίς φθῆναι δυναταὶ δαίμονι χᾶϊρ' ἐνπνύν.
Ὁρφεὺς θῆρας ἐπιτίσιν ἐν ὕρισιν, εἰς δὲ σε Κᾶϊσαρε
Νυν ἀκελινστός ἅπας ὄρνις ἀνακρίκεται.”

Anthol. Lib. I. p. 84. Ed. Hen. Steph. 1566.

It is to this mode of salutation that Persius alludes in the Prologue to his Satires, when he speaks of that necessity which forced him to become a poet, as it forced the *Parrots* and *Pies* to talk.

“ Quis expedit Paittacosuum χᾶϊρε?
Picasque docuit nostra verba conari?
Magister artis ingenique largitor
Venter, negatas artifex sequi voces.”

* The fame of Augustus's and Vespasian's *Parrots* is well known. In later times a bird of this description acted an even still more conspicuous part in an equally imperial house. Basil, the Macedonian, after having ascended the throne of Constantinople, imprisoned his son Leo upon some false accusation; and continued his anger towards him, without regard to the lamentations of his family and their intreaties for his freedom. Moved however by the pitiful tones of one of these birds, which had learned to imitate the lamentations of the household, and to repeat the name of Leo in accents of commiseration, he consented to liberate him; fearing, as the Annalist infers, that his own heart should appear more insensible to the feelings of nature, than that of a bird.—

“ Ἦν καὶ στρουθίον μουσικὸν ἐκεῖ κατὰ τοὺς οἶκον,
Ἐνθα πικρὸς ὀλοφυρμὸς καὶ γοὸς ἐξηχέτο,
Ὅτιρ ἀκοδὸν συνιχῶς φωνῶν θρηνητήσιον,

the most eminent poets. The well known Philippick of the elder Cato against the luxury of his times, in which he particularly declaims against the custom of carrying about these birds in public, evinces the general favour in which they were held; while the high prices at which they were sometimes purchased, and the costly materials of which their places of confinement were composed,* demonstrate the high value which was set upon them. It is not perhaps equally well known that the group, thus favoured by antiquity, forms a detached division in the modern family of *Psittacidae*; and that any species belonging to it may at once be detected in the largest assemblage of these birds, and distinguished by strong generick characters from all the numerous species that have been discovered in modern days. In the present sketch I shall endeavour to point out these generick characters, the geographical limits of the group, and the situation which it appears to hold in the family.

Και τας βοας ἐκδιδάχδιν τας γοείρας ἐκείνας,
 Συνανωλοῦζιν αὐταῖς περὶ τῷ ναυίῃ,
 Καὶ προῦφεσι τοὺς Λεοντάς, καὶ συνδρηνεῖν ἰώκει.
 Τῆτι ποτὶ Βασίλειος ἀκῆστας τῷ στρεβδίῳ
 Λαλῆντος, καὶ τὸν Λεοντὰ φερόντος ἀνα στομα, —
 ————— μαλασσέται τῆς σκληρογνώμουσιν;
 Αἰδυμένος, ὡς εἰοικε, μήπως παρὰ τὴν φύσιν
 Ἀσυμπαδιστέρος αὐτὸ φαίνεται τῷ στρεβδίῳ.”

Const. Manass. Compend. Chron. p. 108. Ed. Paris. 1665.

The word *στρεβδος* was originally used for a *sparrow*; but *στρεβδιον* was chiefly synonymous with *avicula* as the diminutive or familiar name of a pet bird of any kind; and there can be but little doubt that the *στρεβδιον μουσικον* of the imperial palace was a *Parrot*.

* We may form an idea of the splendour of their cages from the description given of one by Statius.

“ At tibi quanta domus, rutilâ testudine fulgens,
 Connexusque ebori virgarum argenteus ordo,
 Argutumque tuo stridentia limina cornu,
 Et querulæ jam sponte fores: vacat ille beatus
 Carcer.—”

Sylv. L. II.

The ancient writers are unanimous in informing us that the *Parrots* known to their times came exclusively from India.* In that country these birds were ever held in the highest honour. We are informed by Ælian† that they were the favourite inmates of the palaces of the princes; and were looked up to as objects of sacred reverence by the religious feelings of the people. From thence they were introduced into Europe at the time of the Macedonian conquest; and the specifick name of *Alexandri*, applied by modern science to the type of the group, in honour of the first European discoverer of it, serves to perpetuate the name of a warrior, who is said to have valued the conquests that extended the boundaries of his empire, chiefly as they served to extend the boundaries of science. It was not until the times of Nero that the *Parrots* of Africa became known to the Romans.‡ Some of

* Aristotle calls the *Psittacus* “το Ἰνδικόν ορνέον.” Hist. Anim. VIII. 146. and Arrian in his Indian History makes it a native of the East, “γίγνεται ἐν τῇ Ἰνδῷ γῇ.” Hist. Ind. cap. XV. Pausanias says it exclusively belongs to that country, “παρὰ δὲ Ἰνδῶν μόνων ἀλλὰ τε κομιζέται καὶ ορνέidis οἱ ψιττακοί.” Lib. II. cap. 28. p. 175. ed. Kuhnii. Solinus assigns it the same exclusive locality:—“Sola India mittit Psittacum avem.” Polyhist. c. 53. p. 120. Ed. Ald. 1518. Ovid and Statius also unite in giving this bird an Eastern origin.

“Psittacus, Eois imitatrix ales ab Indis.”

Amor. II. 6.

“Psittacus, ille plagæ viridis regnator Eoæ.”

Sylv. Lib. II.

See also ÆLIAN. De Nat. Animal. XVI. 2. and XVI. 15.

† De Nat. Anim. XIII. 18. See also STRABO. Geograph. Lib. XV. p. 718. Ed. Casaub. 1620.

‡ See PLINY. Nat. Hist. Lib. VI. c. 29. Diodorus Siculus says that *Parrots* were found in Syria. “Αἱ δὲ τῆς Συρίας ἐσχατιαὶ ψιττακὴ καὶ πορφύρεως καὶ μελεαγρίδας, καὶ ἄλλων ζῶων ἰδίας φύσεως τοῖς χρώμασι καὶ ποικίλας συγκρίσεις.” Biblioth. Hist. Lib. II. c. 53. p. 165. Ed. Wesselingii. It is not however likely that these birds were natives of a country, so far north of their usual habitation, and so near to Europe as to render it improbable that they should not have been known earlier than the Macedonian conquest. It is more probable that the birds alluded to by Diodorus were merely articles of

these birds were among the discoveries made in the course of an expedition sent out by that prince. They came apparently from the neighbourhood of the Red Sea. And it is probable that as that country became more known, numbers of the same race were imported from it into Rome, and formed the chief part of those victims of the *Parrot* tribes, which in after times are said to have supplied the inordinate luxury and wantonness of Helio-gabalus.*

The Indian group thus familiar to the ancients, may be identified with those beautiful birds, equally the favourites of our modern times, which are brought to us from the same country, and which are distinguished by the rose coloured collar round their neck, the brilliant emerald of their body, and the deep ruby of their bill. Pliny points out distinctly the former characters. "India hanc avem mittit, sittacen vocat, *viridem* toto corpore, *torque* tantum *miniato* in *cervice* distinctam."† Solinus, in general the servile copier of Pliny, confirms this description, though

commerce brought from India by the inhabitants of Syria, and being transported from thence to Rome were mistaken for natives of that province. Bochart coincides in this opinion, who thinks that the *Psittacus* was unknown to the Jewish writers. See Hierozoic. Pars. 2^a p. 342.

* The following Bill of Fare which furnished the table of the above emperor may be of some novelty and interest to the *bon vivant*, if not to the naturalist. "Comedit æpius ad imitationem Apicii calcanea *camelorum*, et cristas vivis *gallinaceis* demptas, linguas *pavonum* et *lusciniarum*: quod qui ederet ab epilepsiâ tutus diceretur. Exhibuit et palatinis ingentes dapes extis *mallorum* refertas, et cerebellis *phænicopterum*, et *perdicum* ovis; et cerebellis *turdorum*, et capitibus *psittacorum*, et *fasianorum*, et *pavonum*." Nor did he reserve such delicacies merely for his own table. "Misit et *uvæ* apamenas in præsepia equis suis: et *psittacis* atque *fasianis* leones pavit et alia animalia." *Ælius Lamprid.* Vit. Heliog. Script. Hist. Rom. Min. Tom. III. p. 965. Ed. Hen. Steph. 1568. Numbers however of these birds must have been imported into Rome at a much earlier period, for Apicius himself must have feasted upon no small proportion of them. It is also probable that *Parrots* were among the number of those vocal birds which the elder Aesopus, the tragedian, is said to have sacrificed to his extravagance. "Huic nimirum magis Aesopus —, quem constat cantu commendabiles aviculas, immanibus emptas pretiis, pro ficedulis ponere." *Val. Max.* Lib. IX. c. 1. 2.

† Lib. x. c. 42.

late M. Kuhl, for his exertions in unravelling the intricacies of this subject: and in characterizing the species of *Palæornis*, little more is necessary than a reference to the birds belonging to that group as described in his Monograph* of the family. In mentioning that work, I cannot allow myself to pass it over with mere simple approbation. It has the merit of being the first instance in which the principles, so successfully developed in the "*Horæ Entomologicæ*" in reference to some departments of the *Annulosa*, were applied to a group of the *Vertebrated Animals*: and where the circular disposition in which the groups of nature return into themselves, and the uninterrupted series of affinities by which they are connected together, have been asserted and satisfactorily demonstrated. Whether the views which M. Kuhl unfolded in his Monograph were the result of his own observations on nature, or whether he was originally indebted for them to the "*Horæ Entomologicæ*," it is now impossible to determine. Certain it is that he spent some time in this country in the year 1819, when the work referred to had just been published, and when the principles illustrated in it formed a topick of general conversation and of peculiar interest among men of science. This period was immediately previous to the appearance of the Monograph on the *Psittacidae*, which was published in 1820. Whatever may be our opinions on this point, the work itself affords a superiour example of an attempt at a natural arrangement. The leading divisions, with some slight modification,† will be found to accord with those

* See "*Conspectus Psittacorum*, ab H. Kuhl, Ph. Dr. &c." printed in the "*Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldino-Carolinæ Naturæ curiosorum*." Vol. 10. p. I. Bonnæ, 1820.

† M. Kuhl's grand divisions of the family amount to *six*: but they will be seen, if accurately examined, to compose but *five* of equal degree. His sixth division, which unites the *Cockatoos* and *Macaws*, is composed only of the two species which form the genus *Microglossum*, Geof. St. Hil., or those which M. Le Vaillant denominates *Aras a trompe*. This group, though generically distinct from the other species of the *Cockatoos*, more particularly by the form of the tongue, accords with them so closely in the general characters of the section or subfamily, as to cause an unnatural break if we separate it from them. The only material deviation which it exhibits from the *Cockatoos* is the nakedness of the face: but this deviation merely places it at the extreme of that sec-

more comprehensive and philosophick views, which, from accurate observation of nature, are now almost universally allowed to offer the most faithful interpretation of her laws. And although the minour subdivisions are founded on the geographical limits of the species, a foundation, which if universally adopted would be both arbitrary and insufficient; yet in the present instance this arrangement of the groups before us may be considered as affording, with some slight and partial deviations, the nearest approach to their separation by strict generick characters; so closely are their natural peculiarities in unison with their geographical distribution. It is to be regretted that M. Kuhl did not characterize * the divisions which he has formed. Had he added this necessary finish to his groups, little more would have been left to succeeding naturalists, than to subjoin to his subdivisions those species with which subsequent discoveries encrease the numbers of the family.

Following then M. Kuhl as my chief guide, and assisted also by the splendid illustrations and scientifick notices which M. Le Vaillant has left us of this family, I proceed to point out the species of *Palæornis* now known to us.

* *Mandibulâ inferiore brevi.*

1. ALEXANDRI. Linn. *P. viridis, torque miniaceo, gulâ tæniâque interoculari nigris, maculâ alarum purpureo-rubrà.*

Psittacus torquatus macrourus Antiquorum. Aldrov. Aves. Vol.

I. p. 678. Icon p. 679.

Psittacus Alexandri. Linn. Syst. I. p. 141, No. 34.

tion, where it joins the succeeding section of the *Maccaus*, in which the character of the naked face prevails. We might equally separate many other groups as M. Kuhl has separated this, and call them sections or subfamilies; but they could not stand as separate divisions of the same rank as the rest, not being of equal degree with them in point of distinction or importance.

* M. Kuhl has affixed characters to the leading divisions, and also assigned them names. These latter however he does not use; and the characters themselves extend no further than to the length or evenness of the tail, the nakedness or covering of the cheeks, and the size of the bird itself. He makes little use of the various modifications of the bill, *tarsi*, or wings, or of the tail with the exception of its being even or graduated.

- Psittacus Alexandri. Lath. Ind. Orn. p. 97. No. 46.
 Psittacus Alexandri. Kuhl. Nova Acta, &c. No. 35.
 Grande Perruche à collier rouge vif. Buff. Tom. VI. p. 141.
 Perruche à collier des Isles Maldives. Pl. Enl. 642.
 La grande Perruche à collier. Le Vaill. pl. 30.
 Alexandrine Parrot. Lath. Syn. Vol. I. p. 234. No. 37.—Vol. II.
 69. Ed. 2^a.
 Ring Parrakeet. Edw. pl. 292.
 Alexandrine Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 423.

β. jun. Absque torque.

- Psittacus Eupatria. Linn. Syst. Vol. I. p. 140.
 Psittaca Geringiana. Briss. Vol. IV. p. 343. tab. 29. f. 1.
 Psittacus Eupatria. Lath. Ind. Orn. p. 85. No. 11.
 La grande Perruche à ailes rougeâtres. Buff. Tom. VI. p. 156.
 Perruche de Gingi. Pl. Enl. 239.
 Perruche à epaulettes rouges. Le Vaill. pl. 73.
 Gingi Parrot. Lath. Syn. Vol. I. p. 209. No. 10.—Vol. II. p.
 113. No. 14. Ed. 2^a.
 Gingi Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 438.

Habitat in Zeylonâ.

This species differs from the following chiefly by the greater size of the bill, and the dark red spot on the shoulders. It appears to extend over some parts of the continent of India, but its chief *habitat* is Ceylon.

2. TORQUATUS. Auct. *P. viridis, torque miniaceo, gulâ tæniâque interoculari nigris, maculâ alarum nullâ.*

- Psittaca torquata Briss. Vol. IV. p. 323. No. 55.
 Psittacus Alexandri. var. β. Lath. Ind. Orn. p. 98.
 Psittacus torquatus. Kuhl. Nova Acta, &c. No. 34.
 Perruche a collier couleur de Rose. Buff. Tom. VI. p. 152.
 La Perruche à collier. Pl. Enl. 551.
 Perruche a collier rose. Le Vaill. pl. 22. 23.
 Alexandrine Parrakeet. Lath. Syn. Vol. I. p. 235. No. 37. var. A.
 Rose-ringed Parrakeet.

On a group of Psittacidae known to the Ancients. 51

Rose-ringed Parrakeet. Lath. Syn. Vol. II. p. 160. No. 70.
Ed. 2nd.

Rose-ringed Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 425.

β. var. flav.

Perruche souffré. Le Vaill. pl. 43.

Sulphur Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 428.

Habitat in Indiâ, Africâque.

It is said that this species is abundant on the African Continent, and is found as far westward as Senegal. M. Brisson has asserted that it is a native of America (Vol. IV. p. 326), led into this error most probably from his having received specimens from that country which had been previously imported into it from India. It is not often that we have to notice an inaccuracy of this kind in the works of that naturalist, which may be consulted with much advantage, both for the sake of the information they contain and their scientific views.

3. FLAVITORQUIS. Shaw. *P. viridis, sublus subflavescens, torque flavo, capite, collo postico, rectricibusque mediis cæruleis, his apice albidis.*

Psittacus flavitorquis. Shaw. Gen. Zool. Vol. I. p. 439.

Psittacus annulatus. Bechst.

..... Kuhl. Nova Acta. &c. No. 36.

Perruche a collier jaune. Le Vaill. pl. 75, 76.

Yellow-collared Parrakeet. Lath. Syn. Vol. II. p. 166. No. 75. Ed. 2nd.

Habitat in Indiâ.

4. BITORQUATUS. Kuhl. *P. viridis, torque duplici, superiore cæruleo, inferiore rubro, gulâ nigrâ.*

Psittaca Borbonica torquata. Briss. Vol. IV. p. 328. No. 57.
t. 27. f. 1.

Psittacus bitorquatus. Kuhl. Nova Acta, &c. No. 168.

Psittacus Alexandri. var. 3. Lath. Ind. Orn. p. 98.

Perruche à double collier. Buff. Vol. VI. p. 143.

Perruche à collier de l'Isle de Bourbon. Pl. Enl. 215.

Perruche à double collier. Le Vaill. pl. 39.

Alexandrine Parrakeet. Lath. Syn. Vol. I. p. 236. No. 37.

var. C. Double-ringed Parrakeet.—Vol. II. p. 161. No. 70.

var. B. Ed. 2^{da}.

Habitat ——— ?

M. Le Vaillant saw two of these birds alive, from which he took his description. Their habitat, according to M. Kuhl, is unknown. Dr. Latham, however, who has described the bird as a variety of the Alexandrine Parrakeet, makes it a native of the Isle of Bourbon.

5. *XANTHOSOMUS*. Bechst. *P. læté viridis, capite, caudâ, remigibusque cærulescentibus, tectricibus intermediis citrinis.*

Psittacus xanthosomus. Bechst.

Psittacus xanthosomus. Kuhl. Nova Acta, &c. No. 42.

Perruche à epaulette jaune. Le Vaill. pl. 61.

Habitat in Ternate.

This species rests also on the authority of that accurate observer and naturalist, M. Le Vaillant, who saw a specimen of this bird alive.

6. *MALACCENSIS*. *P. viridis, capite, pileo excepto, colloque postico vinaceo-rubris, guldâ, mystacibus, taniâque interoculari nigris.*

Psittacus Malaccensis. Gmel. Vol. I. p. 325. No. 74.

Psittacus Ginginianus. var. 2. Lath. Ind. Orn. p. 100. No. 50.

Psittacus erubescens. Shaw. Gen. Zool. Vol. VIII. p. 437.

Psittacus barbatulatus. Bechst.

..... Kuhl. Nova Acta, &c. No. 38.

La grande Perruche a longs brins. Buff. Tom. VI. p. 155.

Perruche de Malac. Pl. Enl. 887.

Perruche à nuque et joues rouges. Le Vaill. pl. 72.

Blossom-headed Parrakeet. Lath. Syn. Vol. I. p. 24. No. 39.
var. C. Malacca Parrakeet.—Vol. II. p. 164. No. 74. var. C.
Ed. 2^{da}.

Habitat in Malaccâ, Sumatra, &c.

I have seen several specimens of this beautiful species, which have been lately brought to this country from Sumatra, by Sir Stamford Raffles. M. Bechstein has altered the original name of this bird into that of *barbatulatus*, in consequence of the term *Malaccensis* having been also applied to another species of *Parrot*. But the latter bird belongs to a totally distinct subfamily from that before us; and, thus disposed in different generick groups, they may each possess the same specifick name without interfering with each other.

7. *ERYTHROCEPHALUS*. Gmel. *P. viridis, subtus flavescenti-viridis, capite roseo posticè violaceo, torque nuchali gulâque nigris, maculâ humerali rufâ, reatricibus cærulescentibus.*

Psittacus erythrocephalus. Gmel. Vol. I. p. 325.

Psittaca Ginginiana erythrocephalos. Briss. Vol. IV. p. 346.
pl. 29. f. 2.

Psittacus Ginginianus. Lath. Ind. Orn. p. 99. No. 50.

Psittacus erythrocephalus. Kuhl. Nova Acta, &c. No. 37.

Perruche à tete rouge. Buff. Tom. VI. p. 144.

Perruche à tête rouge de Gingi. Pl. Enl. 264.

Rose-headed ring Parrakeet. Edw. Glean. t. 233.

Blossom-headed Parrakeet.—Lath. Gen. Syn. Vol. I. p. 239.
No. 39.—Vol. II. p. 164. No. 74. Ed. 2^{da}.

Perruche à collier noir. Le Vaill. pl. 45.

Habitat ——— ?

I have never had an opportunity of examining a specimen of this bird, and accurately observing the difference between it and the next species, which is not uncommon: but from the figures of both, given in the above quoted plates, and from the observations of M. Kuhl, who seems to have investigated the point with much attention, they appear to be decidedly distinct.

8. **BENGALENSIS.** Briss. *P. viridis subtilis virescenti-flavus, capite purpurascenti-rubro, posticé lilacino, tæniâ nigrâ cincto, gulâ nigrâ, maculâ humerali purpurascenti-brunneâ, rectricibus mediis cæruleis apice albis.*

Psittaca Bengalensis. Briss. Tom. IV. p. 348.

Psittacus Ginginianus. var. β . Lath. Ind. Orn. p. 100.

Psittacus rodocephalus. Shaw. Gen. Zool. Vol. VIII. p. 434.

Mus. Lev. p. 83.—Vivarium Nat. Vol. 21. p. 877.

Psittacus Bengalensis. Kuhl. Nova Acta, &c. No. 39.

La Perruche à tête rouge de l'Isle de Luçon. Sonn. Voy. p. 79. t. 42.

La petite Perruche à tête couleur de rose a long brins. Buff. Tom. VI. p. 154.

Perruche de Mahé. Pl. Enl. 888.

Perruche fridyututah. Le Vaill. p. 74.

Parrakeet from Bengal. Albin. Vol. III. t. 14.

Blossom-headed Parrakeet. Lath. Gen. Syn. Vol. 1. p. 239. No.

39. var. A. Rose-headed Ring Parrakeet.—Vol. II. p. 164.

No. 74. var. A. Ed. 2^{da}.

9. **PONDICERIANUS.** Gmel. *P. viridis, capite pallidé cærulescenti-cano, gulâ mystacibus fasciâque frontali nigris, alis mediis flavicantibus, pectore abdomineque superiore roseis.*

Psittacus Pondicerianus. Gmel. Vol. 1. p. 325. No. 75.

Psittacus Pondicerianus. Lath. Ind. Orn. p. 99. No. 48.

Psittacus Pondicerianus. Kuhl. Nova Acta, &c. No. 48.

Psittacus mystaceus. Shaw. Gen. Zool. Vol. VIII. p. 436. pl. 63.

Psittacus barbatus. Gmel. Vol. 1. p. 325. No. 73. β .

La Perruche à moustaches. Buff. Tom. Vol. VI. p. 149.

Perruche de Pondichery. Pl. Enl. 517.

Perruche à poitrine rose. Le Vaill. pl. 31.

Mustachoe Parrot. Lath. Gen. Syn. Vol. 1. p. 238. No. 38.—

Vol. 11. p. 162. No. 72. Ed. 2^{da}.

Psittacus bimaculatus. Sparm. Mus. Cars. F. II. t. 30.

Psittacus bimaculatus. Lath. Ind. Orn. p. 90. No. 40.

Bimaculated Parrakeet. Lath. Gen. Syn. Vol. II. p. 163. No. 37.
Ed. 2^{da}.

Bimaculated Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 457.

Psittacus Javanicus. Osbeck. t. I. 101.

Psittacus Javanicus. Gmel. Vol. I. p. 321.

Psittacus Osbeckii. Lath. Ind. Orn. p. 87. No. 16.

Psittacus Osbeckii. Horsf. Linn. Trans. Vol. XIII. p. 182.

Alexandrine Parrakeet. Lath. Gen. Syn. Vol. 1. p. 237. No. 37.
var. E. Javan Parrakeet.

Alexandrine Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 426.
var. Javan Parrakeet.

To these may I think be also added the following synonyms:
the rose colour of the breast seeming to identify the birds described with the species before us, rather than with any other.

Psittacus Alexandri. Amænit. Academ. Tom. IV. p. 236.

Psittacus Alexandri. var. Lath. Ind. Orn. p. 98. No. 37.

Bracelet Parrakeet from the East Indies. Albin. Vol. II. pl. 18.

La Perruche à collier des Indes. Briss. Tom. IV. p. 326. No. 56.

Alexandrine Parrakeet. Lath. Gen. Syn. Vol. I. p. 236. No. 37.
var. B. Purple-ringed Parrakeet.

Alexandrine Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 426.
var. Purple-ringed Parrakeet.

Habitat in regione Pondicerianâ, Javâ, &c.

I have included the above various synonyms under one name, in deference to the opinions of some of our best modern ornithologists, whose authority, from their having devoted much attention to the present subject, must have considerable weight upon this point. I have however some doubts whether the Javanese birds, first described by M. Osbeck as *Psit. Javanicus*, and afterwards by Dr. Latham as *Psit. Osbeckii*, be not distinct from the continental species. In all the birds of the group which I have ascertained to come from Java, I have observed some deviation in their colours and in the distribution of them, from those birds which have been described under the name of *Pondicerianus*; while at the same time the former birds exhibited little variety

among themselves. In this country, however, we want *data* sufficient to determine this point. We have abundance of specimens from Java, but few which can be ascertained to have come from Pondichery. In my doubts on this subject I find myself associated with Dr. Horsfield, who had every opportunity of observing these birds in Java, where they were excessively common; and who has retained to his Javanese specimens the name of *Osbeckii*.

10. BARRABANDI. *P. viridis, sincipite gulâque aureo-flavis, fasciâ pectorali maculisque femoralibus rubris.*

Psittacus Barrabandi. Swains. Zool. Illust. Vol. I. pl. 59.

Scarlet-breasted Parrot. Lath. Gen. Syn. Vol. II. p. 121. No. 24. Ed. 2^a.

Habitat in Novâ Hollandiâ.

This bird beautifully connects the *Parrots* of New Holland with the Indian species of *Palæornis*. The name of *Barrabandi* has been already applied to another species of the family, but a species belonging to a different generick group; it may therefore remain attached to the present species.

**** *Mandibulâ inferiore elongatâ.***

11. PAPUENSIS. Gmel. *P. sanguineo-coccineus, interscapulio, alis reatricibusque viridibus, fasciâ nuchali alterâque interoculari nigris, hâc azureo-marginatâ.*

Psittacus Papuensis. Gmel. Vol. I. p. 317.

Psittacus Papuensis. Lath. Ind. Orn. p. 88. No. 20.

Psittacus Papuensis. Kuhl. Nova Acta, &c. No. 40.

Petit Lori Papou. Sonn. Voy. p. 175. t. III.

Perruche Lori-papou. Le Vaill. pl. 77.

Papuan Lory. Lath. Gen. Syn. Vol. I. p. 215. No. 17.—Vol. II. p. 125. No. 28. Ed. 2^a.

Papuan Parrakeet. Shaw. Gen. Zool. Vol. VIII. p. 440. pl. 64.

Habitat in Papuâ.

Were we enabled to decide the generick station of any bird by an inspection merely of a figure, without having seen the bird

itself, we might venture to subjoin another species of Dr. Latham, his *Psitt. Narcissus*, or *Jonquil Parrakeet*,* to the foregoing list of species. Whether that bird be a distinct species, or merely a variety of some other, the representation of it exhibits all the striking characters both in form and colour of the genus before us; the compact head, the slender, delicate, and graceful body; the elongated tail, the collar that encircles the neck, the dark red spot on the shoulder—in short all the exteriour indications of this beautiful group. Dr. Latham described his species from a single specimen which was alive in the neighbourhood of London: of this unfortunately all trace, as far as I can understand, is now lost, and no second specimen has appeared to throw light upon the subject. It strikes me that the bird was a variety of one of the species enumerated above, most probably of the *Pal. erythrocephalus* or *Bengalensis*, with both of which birds it closely accords in the general disposition of the colouring. M. Le Vaillant has well observed, that, in those accidental variations of colour that take place occasionally in the feathered tribes, as well as in the usual changes that accrue in the vegetable world, where black or the other darker colours become white, green invariably changes into yellow. This he infers to be the case in his *Perruche souffré*, which he considers a variety of his *Perruche a collier rose*, our *Pal. torquatus*. I have myself had an opportunity of observing the uniformity of this mode of variation in a few instances among the *Psittacidae*; but more particularly in a specimen of the *Platyercus scapulatus*, or *King's Parrakeet*, of New Holland, which was for some time alive in this country. The whole of this bird was yellow, with the exception of the head and under body, and the scapular *fascia*, the former of which retained their red, and the latter its ultramarine colour, while the original green had become a decided yellow. If we examine *Palaeornis erythrocephalus* or *Bengalensis*, and imagine to ourselves the mode in which either would be likely to vary, we can easily conceive that the green colouring of the wings, body, and tail, may fade into a lemon or jonquil yellow, the black colour round the neck become white, according to the general law of variation, while the roseate crim-

* Gen. Syn. Sup. II. p. 83. tab. 123.—Vol. II. p. 143. tab. 23. Ed. 2^{da}.

son of the head and of the spot on the shoulders will still retain their original strength of colouring. If we make allowances for these usual changes in either of the above mentioned species, we shall have before us the *Psit. Narcissus* of Dr. Latham.

The station which the group of *Palæornis* appears to hold among the *Psittacidae* seems to be nearly typical, if not entirely so, in that primary section, or subfamily, which is familiarly known to us by the title of *long-tailed Parrakeets*, and to the French naturalists by the name of *Perruches*; and which has been separated by M. Kuhl from the other subdivisions of the family under the sectional name of *Conurus*. Among the groups of that subfamily the genus before us exhibits the greatest developement of its leading character, in the superiour length of the tail; a peculiarity, which is rendered strikingly conspicuous by the prolongation of the two middle tail feathers beyond the rest. In the length of the bill also it seems to hold a central situation in the same subfamily, between the extremes on each side. The corresponding subdivisions of the *Psittacidae* which adjoin the present subdivision of *Conurus*, are, on one side, the genus *Macrocercus* of M. Vieillot, or the group which we call *Maccaws*; and, on the other, that group of short-tailed *Parrakeets*, which M. Brisson denominates *Psittacula*. The former of these, or the *Maccaws*, are noted for the shortness of their bill, that member although strong being considerably abbreviated in comparison to the size of the bird, more particularly the under mandible, which is bent inwards, and almost appears at times to lie concealed within the feathers of the jaws. On the other hand the short or even-tailed tribes, which seem to form the typical groups of the *Psittacidae* in general, have their bill, comparatively speaking, lengthened; the under mandible in particular being much extended, and in some instances having the upper margin nearly straight. Now on examining the subfamily to which *Palæornis* belongs, we shall find that it consists of a series of groups, distinguished from each other by strong generick peculiarities, but following each other by a gradual and perceptible prolongation of the bill which unites the abbreviated bill of the *Maccaws* to the more lengthened bill of the typical *Psittacidae*; and at the same

time exhibiting a gradual abbreviation of the tail as the bill becomes prolonged. The following outline of the succession of these different groups, which it is my intention at an early period to characterize more fully, and distinguish into generic divisions, will afford some idea of the relative situation which *Palæornis* holds among them.

Closely allied to the *Maccaws*, or the *Aras* of the French Ornithologists, by their general form, is a group which is represented by the *Psit. Guianensis* of Linnæus, or the species which M. Buffon, with a happy adaptation of name to character, has distinguished as the *Perruche Ara*. Here the naked cheeks of the preceding subfamily is lost: but a naked space, still retained about the eye, exhibits the rudiments of that character, and evinces the unbroken chain of affinity that unites the two groups. These *Parrakeet-Maccaws* form a somewhat considerable genus, confined chiefly to the New World, the native place also of the preceding subfamily. They are immediately met by two New Holland groups, in which the shortened bill of the *Maccaws* is still strongly conspicuous; one, a group including some of the most diminutive and delicately formed species of the family, such as *Psit. discolor*, Lath., *pulchellus*, Shaw, *venustus*, Temm., and *undulatus*, Shaw, and which may be said in their general structure to exhibit the appearance of pigmy *Maccaws*; the second, a group, which forms the genus *Platycercus*, as characterized in the last volume of this Journal.* This genus, it may be remembered, is distinguished by its broad and depressed tail, and its lengthened *tarsi*. In the latter of these characters it intimately accords with *Pezoporus* Ill.; but the breadth of the tail is lost in that genus, which partially assumes somewhat of the lengthened and arrow-shaped form of the tail of *Palæornis*. In a species of this last group, belonging to New Holland, *P. Barrabandi*, the full characters of the tail and of the other distinguishing peculiarities of *Palæornis* are discernible, with the exception of the *tarsi* being considerably longer than in the Indian species. Here then we have a beautiful connection between the ambulating *Parrakeets* of Australasia, and the weaker and shorter legged groups of India.

* Vol. I. p. 527.

Arriving now at *Palæornis*, we may perceive that this group in general still retains the abbreviated under mandible; but in some of the extreme species, more particularly *Pal. Pondicerianus*, we may detect an increasing length in that member which indicates an approach to the longer billed tribes. In the species just mentioned also we may perceive a gradual decrease in the length of the tail, the two middle feathers, which in the typical species generally exceed the others by three inches or more, in this species scarcely exceeding them by an inch and a half. In the *Pal. Papuensis* again, and other species which holds an aberrant station in the genus, we equally recognize a recession from the typical birds, in its partially changing the emerald green colour that characterizes the present group for the deep red which now begins to predominate in the groups which succeed. We have already observed the striking deviation in the form of the bill of that species. The next division of *Parrakeets*, which, by their lengthening bill and decreasing tail, as well as by other less striking characters, appear to follow *Palæornis*, is one of peculiar interest. The representative of it is the *Psit. hæmatodus* of Linnæus, a bird which was first discovered in the Molucca Islands, but which has since been found* in considerable abundance in New Holland, where it is known by the name of the *Blue Mountain Lory*. In the latter country also two or three additional species of the same group are to be met with which have hitherto escaped observation, or have been considered mere varieties of *Psit. hæmatodus*. Of this latter bird I had frequently heard from several visitors of New Holland, that its mode of feeding was partially different from that of the generality of *Parrots*, and that it occasionally lived by suction, or at least by using the tongue as the vehicle of its food. As I was aware that the birds of that extraordinary division of the globe evince

* It has been supposed by some authors, that the Molucca and the New Holland birds are distinct species; and they are always retained as different varieties of the *P. hæmatodus* even by those who consider them the same. It is most probable that they form two species. But I have been enabled to examine too few specimens of the Molucca birds to have it in my power to form any decided opinion.

a tendency to a suctorial mode of feeding, I felt much anxiety to ascertain this point: but although the *Blue Mountain Lory* has frequently been brought alive to this country, it has not been until lately that I have been enabled to examine the structure of the tongue. By the kindness of a gentleman,* whose extensive anatomical preparations of birds, executed with an accuracy and elegance hitherto unparalleled, and whose acute observations on the structure of their principal organs which have come before him in the course of such interesting labours promise the most beneficial results to science, I have at length had an opportunity of seeing the tongue of a recent specimen. I have thus ascertained that this member in the species in question is totally different from the tongues of *Parrots* in general, which it may be recollected bear a considerable resemblance to that of man,—so much so as to have caused Aristotle to call these birds indiscriminately *ψιττακη* and *ανδρωπολογιστον*, and to have occasioned the epigrammatist in the foregoing quotation † from the “*Anthologia*” to invest the group with the epithet of *βροτογυνεω*;—the structure of it in fact is decidedly brushlike or tubular. Besides *Psit. hæmatodus* this genus contains two species hitherto confounded with that bird, and also *Psit. concinnus*, Shaw, and *pusillus*, Lath.‡ This group however belongs to the Ornithology of New Holland; and as Dr. Horsfield and myself are engaged in investigating that subject with a reference to the extensive Australa-

* I am indebted to Mr. Yarrell of St. James's for the opportunity of examining the tongue of this bird, and of exhibiting it at a Meeting of the Zoological Club of the Linnean Society [April 12th, 1824]; as well as for much valuable information respecting the internal anatomy of birds, which has thrown considerable light upon my researches into their affinities. A vast fund of truly scientific information may be deduced from the researches which that gentleman has pursued with much assiduity and success.

† See p. 42.

‡ I am informed by Mr. Caley, the founder of the valuable Australasian collection belonging to the Linnean Society, that the above little species *Psit. pusillus* feeds occasionally by suction. He has himself supplied that bird with honey, and moistened sugar, which it imbibed with ease and seeming delight. The brushlike structure of the tongue in this species is mentioned also I find by Dr. Shaw [Gen. Zool. Vol. VIII. p. 471.] and Dr. Latham [Syn. Vol. II. p. 194. Ed. 2^{da}]

sian collection belonging to the Linnean Society, I refrain from saying more on these interesting birds at present, than that while they retain their affinity to *Palæornis*, by still showing the rudiments of a collar round the neck, they exhibit in the deep red and blue colours that partially contrast themselves with the green, a near approach to the true Indian *Lories*. A beautiful species, the *Psit. ornatus* of Linnæus, or *Perruche Lori* of M. Buffon, a name most significant of the affinities of the bird, immediately unites the two groups. In that species we may observe an exact similarity of colours, and the same disposition of them as prevails in *Psit. hæmatodus*; this is so strongly the case as to render it difficult at first sight to distinguish the former bird from the supposed female of the latter. The tail, however, considerably shorter than in *hæmatodus*, and nearly approaching the short tail of the *Lories*, points out a distinguishing character, and evinces the central and connecting position of this species between the two genera. We have now entered fully among the Indian *Lories*, the genus *Lorius* of M. Brisson, a distinguished group, known by their brilliant red, and deep amethystine plumage, and familiar to all whose thoughts and feelings are associated with the East. In some of the species, as for instance *L. domicella*, the vestiges of the collar round the neck are still discernible. The chief character of the group is the form of the tail, which is as short as in the typical, or even-tailed *Parrots*, but which retain the cuneated form of the long-tailed subfamilies. In this peculiarity it appears to stand at that point in the present circle of long-tailed *Parrakeets*, which immediately touches the neighbouring circle composed of the short and even-tailed birds. In the bill also, which we have seen in the preceding groups to desert the abbreviated form of the bill of the *Maccaws*, and to become gradually longer, the genus *Lorius* is allied to the typical subfamilies, where the under mandible presents the greatest length that is found among the *Psittacidae*. We have still a strong peculiarity to notice in these *Lories*: their tongues also, in addition to that of *P. hæmatodus*, partake of a singular construction. I am informed by Sir Stamford Raffles that all these birds have an apparently tubular or brushlike tongue, which he has been frequently in-

duced to notice in consequence of the rough feel which that member possesses when applied to the skin. How different this roughness is from the soft touch of the *Parrots'* tongues in general, may be decided by those who are accustomed to the familiar habits of these birds, one of the most usual of which is the playful mode of passing their tongue over the hands and face of those to whom they are attached. The singular anomaly presented by this unusual structure of the tongue, in the birds already mentioned, to which may be added the equally singular conformation exhibited in the tongue of *Microglossum*, affords scope for various and interesting conjectures. And it is to be hoped that means may be taken to ascertain more in detail the nature of the member itself, as well as the use to which it is applied, by those who have the opportunity of observing the manners of these birds to any extent. But to return to our series of affinities. A strong affinity to the genus *Lorius* may be traced in an assemblage of small *Parrakeets* apparently peculiar to the Indian Ocean, of which *Psit. pyrrhopterus* Lath., described in the last volume of this Journal, *Psit. Sparmanni* Le Vaill., and *Psit. fringillaceus* Gmel., may be adduced as examples. In all the birds of this group the bill has much of the form of that of *Lorius*, while in many of them the deep red and blue colours still prevail; but the tail gradually increases in length, and becoming more cuneiform, indicates a return to the long-tailed tribes from which we commenced. A group of South America seems immediately to meet them, of which I would select *Psit. aureus* Gmel., and *viridissimus* Temm. et Kuhl, as the representatives; and these birds in conjunction with *Psit. Carolinensis* Linn., and others where the bill becomes stouter, and the tail still longer, complete the circle of this subfamily by uniting themselves with the *Parrakeet-Macaws* which claimed our earliest notice as we entered it. The limits of the groups which I have last particularized, as well as of many of the remaining *Psittacidae* are difficult to be determined, while the materials to which we have access in this country are so scanty. We may seize upon the prominent forms and detect the great outlines of the groups of nature; but to fill up the sketch in

detail and complete the picture is not permitted us amidst the poverty of our resources. For that purpose it is necessary to have recourse to the foreign storehouses of nature, which, to the shame of this nation be it spoken, overflow with the treasures of those countries which England might once have considered exclusively at her command.

It is not easy to decide, although we may form a probable conjecture on the subject, how many, and which of the foregoing species of *Palæornis* were known to the ancients. Elian expressly tells us that they were acquainted with three species.* But as some of the more common species approach each other most closely in their specific characters, it is not improbable, that the differences between them might have been passed over by observers who were so little accustomed, and had so little occasion, to pay attention to minute distinctions, and that four or five species at least were familiar to antiquity. The birds that come from the remoter Indian islands, *P. Papuensis*, *Malaccensis*, and *xanthosomus*, in particular, are in all likelihood among the number of those which have been only known in recent times. To these may of course be added the newly characterized species from New Holland, the *P. Barrabandi*. The beautiful blossom-headed species also, *P. erythrocephalus* and *Bengalensis*, which are even now more rarely met with than the neighbouring species, most probably did not come under the observations of the ancients; for it is improbable that they should have passed over without notice the lovely and changeable roseate colour of the head, which casts into the shade even the collar round the neck so frequently alluded to by them, if either of those birds had been before them. The poets, at least, would have seized upon a character which involved so truly poetick an image, and Ovid or Statius would have woven it up among the most conspicuous wreaths of their beautiful elegiack garlands. *P. bitorquatus*, the locality of which is unknown, is at present of rare

* Εν Ἰνδοῖς μανθάνω σιττακὺς οὖν τις γίνεσθαι, — Γενν τρεῖς αὐτῶν ἀκμῶν· οἱ πάντες δὲ ἔτοι μάθοντες, ὡς παῖδες, ἔτῳ καὶ αὐτοὶ γίνονται λαλοὶ, καὶ φθιγγονται φθιγγμα ἀνδρωπικόν. De Nat. Anim. Lib. XVI. c. 2.

occurrence ; but it formerly might have been more generally distributed. The species which we can imagine to have been best known to former times are the *P. Pondicerianus* and *flavitorquis*, which are diffused over the whole of the Indian continent : the former species more particularly, which is now also found to be dispersed over a great extent of the Eastern Archipelago. *P. Alexandri* appears to have been the bird sent from Ceylon to the Macedonian warrior from whom it derives its specifick name ; Ceylon, or the antient Tabrobana, being the principal resort, even down to the present moment, of that species. And it is probable also that the Romans, particularly in later times, received a great number of the same species from that island, with which they maintained an extensive and regular commercial intercourse after its discovery under Claudius. If to these birds we add the *P. torquatus*, which is the species that agrees most intimately with the descriptions of Pliny, and after him of Apuleius, and which is generally scattered over the Indian, as well as the African continent on the eastern side, we shall probably have before us all the species known to the ancients of this classical group.

ON A NEW GENUS OF FALCONIDÆ.

THOSE inquirers into nature who have been accustomed to consult her works with a view to the affinities by which they are connected together, cannot fail to have remarked, that, in groups which are denominated osculant, or, in other words, which form the passage between neighbouring groups of a higher degree and denomination than themselves, a greater diversity of form, and a more frequent interchange of character is discernible, than in groups more strictly typical, and more distant from the point of junction. In passing from one leading form to another, nature seems to advance with greater caution and a slower pace than usual : she appears to fluctuate between a manifest reluctance to relinquish the tracts which she has left behind and an anxiety to anticipate those upon which she is about to enter ; alternately retracing or advancing her steps, and nearing with somewhat of an apparently wayward indecision the different points of each.

But when once she has cleared the narrow windings of these intervening passages, and has ascended the typical heights, she seems to have gained, as it were, a table land, where she can expatiate with a wider range, and indulge herself with more excursive freedom. In the slight sketch of the family of *Falconidæ*, which I drew out in the last volume of this Journal, this singular propensity is strongly exemplified. Among those groups of *short-winged Eagles* which intervene in affinity between the more typical *Eagles* and the *Hawks*, as also among those groups which form the connecting bond between the *Hawks* and the true *Falcons*, we may have noticed a considerable number of forms, somewhat abruptly interchanging the respective characters of both the neighbouring groups, among a rather inconsiderable number of species. While on the other hand, when we examine the typical groups both of the *Hawks* and the genuine *Falcons*, we are struck by the disproportioned multitude of species which exhibit the typical characters of these groups with little deviation, except in those extreme species which partially blend into the conterminous subdivisions. Observing this peculiarity to prevail so generally in the groups which have already come under our observation, we need not be surprised at finding, that, among the numerous additions which are every day accruing to our stock in Zoology, we should have frequent opportunities of again discerning a variety of new forms in such osculant and intervening assemblages; but forms, chiefly confined to one, or at least to a very limited number of species.

When we are presented with any subjects of Zoology thus peculiarly circumstanced,—or to recapitulate more particularly the case in question, when we have three or four or more species before us, which, taken together, constitute an intermediate passage between leading groups, but which, separately considered, are endowed with forms differing from each other, and partially partaking of the characters of these conterminous leading groups on each side,—it becomes a question whether we should characterize each species as a separate genus, or unite all into one connecting group. The answer to this question depends upon the nature of the characters that mark these forms. If these are striking,

essential, and permanent, or if they exhibit any peculiarity in the mode in which they are combined or interchanged with each other, there seems to be no reason why here, as well as in every other similar instance of distinction in form, the groups, in which such characters predominate, should not be distinguished by a separate name. Natural science has now arrived at such a comparative state of perfection, and the materials that supply it with subjects for speculation have become so far multiplied, that the naturalist no longer investigates new subjects for the purpose of discovering new species, but with the view of detecting new forms: and to point out these forms by the most distinguishing means in his power, and thus mark the grander modifications by which nature varies her operations, has become one of the higher objects to which he aspires in his philosophick researches. In multiplying the names of groups he subjects himself, it is true, to the objections of those who, in opposition to the modern views of the science, contend that the imposition of names is but an imposition of difficulties. But even if we were gratuitously to concede for a moment that a new name creates a new difficulty, that very difficulty itself would bring with it its own justification. It would cause the student to pause in his career: it would force him to dwell more intently upon the important object thus strongly pointed out to him; it would enchain his attention to one of those more impressive facts that expand the mind as they open to it a view of the sublimer principles which regulate the wonders of the creation. The check which he receives would be a spur to his observation, and impose an additional retainer on his memory. The present however are not the times in which science is to be arrested in its march by objections such as these. New names impose new difficulties!—The influx of new species is as little to be desired by such objectors as that of new forms or new genera; for species as well as groups must have their names. If we deny the naturalist the privilege of affixing them in one case, we must debar him from it in the other. If we are to be frightened by names, we must explore the fields of science no further, but tread over in dull repetition our old beaten tracks. And with what a *terra incognita* would such narrow restrictions obscure our map.

of nature ! We must remain content with the little that we already know : we must close the volume at the page where our indolence hints to us that we have read enough, and exactly at that page where the true interest of the subject matter begins to unfold itself. We must admit no novelty that requires to be named ; nothing from those untrodden and boundless regions whence the inquiring mind already thirsts in imagination for new springs of knowledge—from the heart of Africa—from the hitherto inaccessible empires of the East—from the exhaustless recesses of Australasia and the New World ; nothing of all the “ countless myriads ” of extinct forms that lie still uncharacterized in the bosom of the earth, or of the living forms that wait for time to bring them to light from the depths of the ocean. All these must be hid for ever from the eye of science, because the knowledge of each would necessarily bring with it the imposition of a name. But the force of such objections is dying away daily. In declaring my own intention that whenever I find a new form I shall unhesitatingly characterize it with a new name, I apprehend that I utter but the feeble echo of the voice in which every superiour naturalist speaks who trusts to nature alone as a guide to his investigations : and that I pursue a plan which has not only been followed with success by the greater part of the most enlightened foreign naturalists, but which has been almost universally adopted in this country in every branch of Natural History, with the exception,—and why there should be that exception I know not,—of the hitherto circumscribed department of Ornithology.

A small and beautiful *Hawk*, which has been kindly submitted to my inspection by Mr. Swainson, one of the fruits of that gentleman's extensive researches in Brazil, affords me an opportunity of putting my resolution into practice. This bird decidedly belongs to the *Accipitrine* subfamily of the *Falconidæ* ; but it is placed at that remote extremity of it, where the species, gradually approaching the *Falcons*, partially assume some of their leading characters. It possesses the bill of the *Hawks*, and also the shortness of wing which so strongly characterizes them : but the structure of the wing itself is the same as in *Falco*, the second quill feather being the longest, and the first and second of these

feathers being marked on the inner web by an abrupt emargination near the apex: while the *tarsi* also display the character of the same group in having the *acrotarsia* reticulated. The bird thus exhibits a striking modification of form, at once partaking of the chief of the respective characters of both the *Hawks* and *Falcons*; with the former of which it may in addition be observed that it agrees in its general form, and with some of the latter, particularly the beautiful group of *Ierax cærulescens*, in its colours, and in the general distribution of them. To the latter group indeed it has a striking resemblance, and might perhaps be referred unconditionally to it, could we pass over the important character of the untoothed bill. In characterizing new forms, I wish to perpetuate those names, as far as they are applicable, which are preserved in classical writers. These of course should be affixed to groups, to which they may be supposed to have formerly applied. But there are cases where we can not hope to find new forms suited to old names; as for instance among the *Falconidæ*, where it is not likely that we shall meet with an European new form to suit an ancient unappropriated raptorial epithet. Here it is allowable I presume to look beyond the ancient boundaries for an appropriate subject; and the bird before us, although a New World species, I shall invest with an Old World name.

GAMPSONYX.

Rostrum breve; *mandibulis* integris; *naribus* rotundatis.

Alæ breves; *remige* secundâ longissimâ, tertiâ secundæ ferè æquali; *primæ* et *secundæ* *pogonio* interno fortiter prope apicem emarginato.

Cauda mediocris, æqualis.

Pedes mediocres; *tarsis* reticulatis, *acrotarsiis* infra genu usque ad medium plumatis.

SWAINSONII. *G. supernè cineraceo-niger, subtus albus; fronte, genis, abdominis lateribus, plumisque femoralibus aurantiacis, maculâ pectorali utrinque nigra.*

Rostrum nigrum. *Dorsi* plumæ, *scapularesque* cineraceo-nigræ, ferrugineo-maculatæ. *Latus inferius torquesque* nuchalis

70 Mr. Kirby on a pair of horned mandibles of an Insect.

albi, parcé aurantiaco-variegati. *Remiges* nigrescentes, interné ad apicem albo-marginatæ, secundariæ parcé ferrugineo-sparsæ, subtus albæ. *Rectrices* cineraceo-nigræ, interné, mediis exceptis, albo-marginatæ, subtus albæ. *Pedes* flavi, unguibus nigris. Longitudo corporis, $9\frac{2}{3}$ unc.; alæ a carpo ad remigem 2^{am} , $6\frac{3}{8}$; mandibulæ superioris, ad ceram $\frac{1}{16}$, ad rictum $\frac{7}{16}$; inferioris $\frac{1}{16}$; tarsi, $1\frac{1}{16}$.

Habitat in Brasiliâ.

D^r Swainson, naturæ indagatoris seduli, acutississimi, felicissimi, hæc avis, ab illo primum detecta, merito nomen ferat.

The following MS. note was appended to this bird in Mr. Swainson's hand writing. "The only individual of this species I ever met with was shot on the Table Land, about 10 leagues in the interior of Bahia in a direction W. S. W. from the Bay of St. Salvador. It was perched on the trunk of a withered tree, apparently watching some small birds. The *tarsi* are bright and the *irides* hazel."

[To be continued.]

ART. IX. *A brief Description of a pair of remarkable horned mandibles of an Insect. By the Rev. WILLIAM KIRBY, F.R. & L.S., &c.*

THESE mandibles* were taken from a string of green beads and other trinkets brought from New Zealand, formerly in the collection of Mr. G. Humphreys, and now in that of R. D. Alexander, Esq. F. L. S. of Ipswich. They appear to have belonged either to a *Lucanus* or a *Prionus*, and consist of the mandible itself, which is trigonal, very strong, and armed internally with five short teeth, that of the base being a molar one,—and of a horn nearly an inch and half long, incurved at the apex, armed with an obtuse tooth below the middle, above which it is transversely sulcated; the sulci being separated by tubercles alternately elevated and depressed. This gives the horn, which rises from the base of the mandible and forms an acute angle with it, the appearance in some measure of that of an Antelope. The animal, whatever it turns up, might be distinguished by the trivial appellation of *Antelope*.

* Plate I. fig. 7.

ART. X. *An inquiry into the true nature of Instinct, and of the Mental Distinction between Brute Animals and Man. Essay III. On the Specific Constitution of the Brute Mind, and its modifications under Human Influence: including an analysis of the theory of Brute Action contained in Dr. Hancock's "Essay on Instinct, and its Physical and Moral Relations."* By JOHN OLIVER FRENCH, Esq.

WHEN we consider the influence which operates the guidance of beings forming the lower degrees in the scale of animal existence, we are struck with the varied manifestations of an intelligent cause: upon the subjects of this influence, the mind dwells with an unembarrassed delight, in great measure arising from the clear view which is afforded us of their definite station in the mental universe, as the humble agents of a Wisdom not their own. The other portion of the sphere of Brute action claims, however, as strong, though less placid, an interest, and invites our powers of investigation, as presenting a more perfect analogy to the unshackled intelligence of the human mind. An important elucidation is here as it were spontaneously aimed at; and the question arises, how far the nature of the Brute is in reality assimilated to our own. The conduct of animals in a state of intercourse with Man, presents, therefore, an apparent point of contact with him, which is peculiarly deserving of attention. For if the Brute *really* be susceptible of education by the same Free Principle as Man, the inference is, that, like Man, he is a rational agent; but if the contrary, he is then, notwithstanding appearances, only a subject in nature fitted to receive peculiar influences of a moral and rational order; some of which may be impressed by the immediate agency of man, according to a certain law of permission: and thus he forms but a part of that mirror in which man's reason is reflected.

To attempt some illustrations of this point, will form the main object of the present Essay:—but as a work, written by Dr. Hancock, professedly upon the subject of Instinct, has recently made its appearance, and as this work necessarily enters into the

discussion of principles which affect the present investigation, I shall offer, without the etiquette of an apology, an incidental sketch of the general views it developes, so far as these respect the mental faculties of animals; in doing which, I shall also take the liberty of discussing the author's opinions, so far as they affect the general inquiry proposed in my previous essays, and with a view to the more immediate point of investigation proposed in the present paper:—namely, the nature of the positive influence of the human mind, upon the mind of the brute subject.

It is proper here to premise, that the work in question includes a general theory of the human mind, in connexion with pure Theology, which the author indeed states to be the ultimate object of his labours. Any remarks upon this (no inconsiderable) portion of the book, would here be out of place; the observations which close the present paper, and which were written antecedently to my perusal of Dr. Hancock's work, will however, I trust, go to shew, by their coincidence with the author's sentiments on the subject they advert to, that whatever views I may take of his reasonings on the capacities of the Brute, are stated in candour, and are not the mere effusions of a cavilling spirit.

I may here briefly remark that the author's opinions relative to the nature of the operation of a First Cause in the universal sphere of Creation, although not new, are highly illustrative of the subject. Dr. Hancock devotes a considerable portion of his book to support the conclusion, that Man is continually in the reception of a Superior Principle, from which the elements of all his knowledge are deducible, and quotes a numerous list of eminent authorities, ancient and modern, in the support of this particular view—namely, That First Principles are intuitively received by Man, and that the reasoning or discursive faculty proceeds or is derived from them, and operates upon the outward perceptions, which the mind forms by means of the senses.

With whatever supposable facility then, we may define the boundary of human rationality, it is confessedly no easy matter to mark, in language, the limit of the operation of the influential power on the one hand, and of the subordinate non-rational freedom, on the other, which, taken together, present a general view of the

principles of brute action. That a remote freedom of this kind is possessed even by the vegetable subject is evident. It cannot be supposed, for instance, that the lines in which the fibres of the roots extend themselves from the trunk are predetermined and geometrically directed in their course; although there is an influence which unquestionably directs their multiplication and extension in the quarter to insure sustenance or security: there seems therefore to be a remote degree of subordinate freedom proper to the plant, by which it shoots out its roots according to a law of *regulation*, and, at the same time, a law of *permission*.* In the actions of Animals, *their* subordinate freedom will be increased in its perfection to the degree in which we observe it; and in many of the actions of the higher classes among them, this freedom will form the most prominent, because the most apparent feature: such for instance as in that of a cur worrying a harnessed horse in his progress, and all the more ordinary and indifferent actions of animals. This subordinate freedom must, however, have its limit; and Dr. Hancock has endeavoured to assign this limit, as respects animals, by restricting the use of the term *Reason* to signify what metaphysicians have termed the "*Discursive Faculty*," or power of ratiocination and comparison, considered abstractedly from those *Superior Principles* which he includes in the "*enlarged use*" of the term *Reason*, and which he considers as belonging exclusively to Man.

Now although a distinction, in terms, respecting those indifferent actions to which I have just adverted, might perhaps be made, the adoption of the term *reason* would be evidently, in this case, improper; since this term, by common consent, includes higher principles: thus the actions which Dr. Hancock has taken as types of the operations of this "*Discursive Faculty*," or "*Reason*,"

* "When two trees of the same kind are planted," says Dr. Fleming, "the one in a sheltered, the other in an exposed situation, we witness the display of this faculty (instinct) in a very remarkable degree. The former pushes forth its roots in all directions, more especially where there is the greatest supply of nourishment, and the highest temperature; while the latter, which, were it to act in the same manner, would be speedily overturned, multiplies its roots in the direction of the strongest blasts, and these, acting like the stays of a ship's mast, preserve the trunk in its vertical position. Phil. of Zool. vol. 1. p. 18."

require, in order to their accomplishment, something more than is included in his restricted definitions of this faculty—they require something which essentially belongs to those Superior Principles which are elsewhere included by the author in what he terms the “*enlarged use*” of the term Reason,—something which, as to its nature, is above the contemplation of the Brute, and which, if it be not within the consciousness, must operate above it, as in the case of *Direct Instinct* it confessedly does.

Treating of the “*Enlarged use of the word Reason*,” and speaking of Dugald Stewart, Dr. H. observes—“He is therefore desirous not to confound our rational powers in general, in which he includes the *elements of Reasoning itself*, in other words, the fundamental laws of human belief, with that particular branch of them, known among logicians by the name of the *Discursive Faculty*. And he says, ‘the remark of Dr. Campbell, that without the aid of some other mental power than the discursive faculty, we could never attain a notion of what is good, is undoubtedly true, and may be applied to all those systems which ascribe to Reason the origin of our moral ideas, if the expressions Reason and Discursive Faculty be used as synonymous.’”—“But though he (Dugald Stewart) does not ‘call in question the accuracy of those who have ascribed to it the function of distinguishing right from wrong,’ he does not himself assign to Reason this function.”

“Some authors,” observes Dr. Hancock, “are quoted by this writer to shew the enlarged acceptance in which the word has been used. ‘Reason (says Hooker) is the director of man’s will, discovering in action what is good; for the laws of well-doing are the dictates of right reason.’”

At page 253, when treating of the *Elements of Moral Feeling*, Dr. H. observes, “There appears to me to be great propriety in the following remarks from Dr. Beattie. ‘Truth is something fixed and determinate, depending not upon man, but upon the Author of Nature. The fundamental principles of truth must therefore rest upon their own evidence, perceived intuitively by the understanding.’

‘Why should not our judgments concerning Truth be acknowledged to result from a *bias* impressed upon the mind by its

Creator, as well as our desire of self-preservation, our love of society, &c.? If those judgments be not *instinctive*, I should be glad to know how they become universal:—If those judgments be not *instinctive*, I should be glad to know how men find it so difficult, or rather impossible, to lay them aside.’—‘Morality is founded on certain first principles.’—‘I do not say,’ observes Beattie in another place, ‘that any particular moral principle is *innate*, or that an infant brings it into the world with him: this would be as absurd as to say that an infant brings the multiplication table into the world with him. But, I say that the moral faculty which dictates moral principles, and the intellectual faculty which ascertains proportions of quantity and number, are original parts of man’s nature; which, though they appear not at his birth, nor for some time after, even as the ear of corn is not seen till long after the blade is sprung up, fail not, however, provided outward circumstances be favourable, to disclose themselves in due season.’”

And at the commencement of his work, Dr. Hancock has the following definitions.

“It is proper, for me here to remark,” he says, “that the word Reason is used in senses which are extremely different; sometimes to express the whole of those powers which elevate man above the brutes, and constitute what is called his rational nature; more especially, perhaps, his intellectual powers; and sometimes to express the power of deduction or argumentation. The former is the sense in which the word is used in common discourse. It is in the latter restricted sense, that I wish the word Reason to be understood, wherever it occurs in this Essay, viz. the discursive faculty, wholly depending on outward evidence for its conclusions. Hence, if there be any actions which are performed with every indication of design, forethought, and wisdom, which are not the result of instruction nor of individual experience, but of a power operating above the consciousness of the creature, and directing it with unerring certainty to some specific ends, by means far beyond its comprehension, whether in man or in the brute; these actions are *instinctive*. And on the other hand, if there be any actions, which evidently result from observation and instruc-

tion, indicating an intelligent power of combining means and adapting them to ends of which the creature is conscious ; these actions come within the province of *Reason*."

I must here remark that these definitions appear but ill to harmonize with the author's general views before stated. For, it may be asked, does not "an intelligent power," in the case of Brutes, "combining means and adapting them to ends of which the creature is conscious," presuppose some of that intuitive light which the author considers "*instinctive*?" In this view it is difficult to separate, in a practical sense, the two definitions. Besides what is *intuitive* in Man is *not instinctive* in the sense that *intuition* is *instinct* in the Brute ; for the former surveys and is conscious of this light of intuition or intelligence within, whereas the latter is not ; this intuition in the latter is therefore intellectually blind, however exalted the actions be which it enables him to effect.

To proceed however with the Theory before us. Reason, excluding any conscious superior light, and limited to signify the "Discursive Faculty" before mentioned, is considered by the author as a principle common to Man and Brute, and is treated of in the early part of the volume, as to its being an attribute of the latter, in the Section (p. 77) "*On the power of Reasoning, or drawing inferences in Animals*." The Chapter commences thus :—"If we come to consider the instances of attachment, cunning, fidelity, sagacity, gratitude, &c. in many of the lower animals, as well as the difference between old and young in point of experience and usefulness, we cannot refer them to Instinct as above explained. For we find them so numerous and well authenticated, and these individual actions so diversified and adapted to times and circumstances, that if man is beholden to Reason for this power of adaptation, we must also admit that the brutes are likewise possessed of a degree of rationality. For as far as we are enabled to judge of the uniformity of Instinct, and of the power of the natural senses, these instances of sagacity belong neither to one nor the other. Consequently they must belong to Reason, or that intermediate power which compares and combines, adapting means to ends, and varying these means according to emer-

igencies. For supposing the higher orders of brutes are conscious of the acts, they can be classed with no other operations of mind with which we are acquainted." This is however qualified by the following—"Yet it would appear, that all the acts of apparent reasoning in the lower animals have reference to some immediate object of perception, or depend on the faculty of memory. As they seem to be nearly incapable of forming any abstract notions or speculations apart from sensible objects; and the want of articulate language must ever oppose an insurmountable barrier to their progress in acquired knowledge, beyond the merest individual experience."

The author then proceeds to examples, from which I select the following as typical of the class.

"Dr. Abell, in one of his Lectures on Phrenology, related a very striking anecdote of a Newfoundland dog in Cork. This dog was of a noble and generous disposition; and when he left his master's house was often assailed by a number of little noisy dogs in the street. He usually passed them with apparent unconcern, as if they were beneath his notice. But one little cur was particularly troublesome, and at length carried his petulance so far as to bite the Newfoundland dog in the back of the foot. This proved to be a step in wanton abuse and insult beyond what was to be patiently endured; and he instantly turned round, ran after the offender, and seized him by the skin of the back. In this way he carried him in his mouth to the quay, and holding him for some time over the water, at length dropped him into it. He did not seem, however, to design that the culprit should be punished *capitally*, and he waited a little while till the poor animal, who was unused to that element, was not only well ducked, but near sinking, when he plunged in, and brought him out safe to land."

Now when actions like these are adduced as illustrations of the conscious reasoning powers in Animals, we must surely ascribe to them something more than a mere ratiocinating faculty, as limited by Dr. Hancock's theory:—in the present case a moral principle, regulating the extent of punishment by the extent of crime. Accordingly, in an implied agreement with this sentiment, Dr.

Hancock remarks in allusion to this fact, "It would be difficult to conceive any punishment more aptly contrived, or more completely in character. Indeed, if it were fully analysed, an ample commentary might be written, in order to shew what a variety of *comparisons*, and *motives*, and *generous feelings*, entered into the composition of this act. It supplies at least a good moral lesson. *It shows the difference between magnanimity and meanness*, and by what lawful means the former may correct the latter." At page 98, we read as follows: "Many animals, when domesticated or trained to useful purposes, and associated with civilized man, display signs of affection, gratitude, and ingenuity, with other noble and excellent traits of character, which, considering they are *not bound by the obligation of any moral duties*, are truly wonderful."—"It would be easy to add anecdotes of many other animals to those I have collected: and I would just repeat the observation, that in contemplating the acts in question, there is every reason to think, the animals are in a *good degree* conscious of the end and design of such acts, *perhaps as much so as many of our fellow creatures are when lending their assistance to us in the same way*. But this cannot be proved: nor can it ever amount to more than a high degree of probability; for the want of artificial signs, without doubt very wisely, *prevents all mental intercourse* between man and the brute. So that we can never understand to what degree they are conscious agents, beyond the outward evidence of natural language. If it should be thought by some a mark of the *irrational* or brute nature not to comprehend the connexion of means and ends, and to be unconscious of design, it is on the other hand sufficiently clear, that like the lower animals in many instances, multitudes of our fellow creatures suffer themselves to be employed in various operations, and frequently act without having any clear knowledge of the complicated means or end which the superior understanding, whatever it is, to which they submit themselves, has in view."

Upon this passage, I would remark, that if these displays of "affection, gratitude, and ingenuity," with other "noble and excellent traits of character," are observed in brutes, and if "there is every reason to think the animals are in a *good degree* conscious

of the end and design of such acts, perhaps as much so as many of our fellow-creatures are, when lending their assistance to us in the same way,"—and if at the same time "they are not bound by the obligation of any moral duties,"—it is evident they must be the *conscious subjects* of that superior principle of rational intuition by which the author distinguishes man, with this incompatible addition, that they are *not* accountable agents.—Is not this (contrary no doubt to the author's intention) confounding the nature of Man and Brute? According to these principles the dog who plunges into the water and rescues a poor human being from death, has a consciousness of the act, the same *in kind* with that of the savage, who performs a similar action; and who, although, if brought into civilized society, he may "frequently act without having any clear knowledge of the complicated means or end, which the superior understanding, whatever it is, to which he submits himself, has in view," is yet *capable of acquiring such knowledge and superior understanding*; while the brute under similar circumstances remains fixed in the station which he previously occupied.

The conclusions then, drawn by Dr. Hancock, respecting the conscious principles which actuate Brutes in instances like the foregoing being the same which actuate human beings themselves, shews that he considers the consciousness of both to be the same *in kind* under similar circumstances. But the ambiguity and confusion which such an opinion involves, may be seen in the following paragraph, which leaves the mind in doubt and distraction as to the limit it essays to define.

At page 96, we read :—"On taking a review of most, if not all, the actions of the lower animals we have been last considering, I think it must be obvious, that whether we allow them reason or not, the actions themselves comprehend those elements of Reason, *if I may so speak*, which we commonly refer to rational beings. So that if the same actions had been done by our fellow-creatures, we should have ascribed them without hesitation to *motives and feelings worthy of a rational nature*. It is certain that most of these animals in their several *rational acts* (*if I may call them such*) show every outward sign of consciousness or knowledge of the end of their actions—a consciousness, too, immediately

directed to the welfare of man ; not like the fixed and uniform operations of Instinct, which pays no regard to Man, but, when acting in the Brutes, is wholly employed in their self-preservation, or in providing for their young."

"As no man then, can clearly point out, by what delicate and hidden steps, even the human mind is conducted in passing from premises to conclusion ; as he cannot trace what animal propensities and feelings of his sensitive nature, and prejudices, and moral principles govern and influence his various decisions, constituting what he calls an act of human reason, farther than the end can be accounted for by the means ; so neither can he comprehend the impelling motives of the brute, except by their visible actions. If these visible actions, therefore, correspond with his own ideas of what is excellent in feeling and judgment, they must either proceed from faculties like those of that part of human nature to which the brute is clearly allied, or from a much higher source. But as they do not appear to belong to Instinct, or a necessary and unavoidable impulse compelling them to act, nor yet to those more dignified principles of the human character, of which the brute *shows no signs* ; they may be considered analogous to those principles which govern human beings themselves under corresponding circumstances ; and consequently presuppose a limited degree of *rationality*, as we strictly apply the term.*

What, it may be here asked, are we to understand by "motives and feelings *worthy of a rational nature*," if this rational nature is to be confined to Dr. Hancock's previous limitation ; and is not made to include a superior consciousness arising from that superior rational intuition elsewhere ascribed by the author exclusively to Man ? "Affection, gratitude and ingenuity," with other "noble and excellent traits of character," are certainly observable in brutes ; but the latter are, I conceive, *in no degree* conscious of the nature of affection, gratitude, or ingenuity, and are therefore not *rational-ly* (in the enlarged sense of the term, which is here implied) affectionate, *rationally* grateful, or *rationally* ingenuous ; but *instinct-*

* By "analogous," Dr. H. here evidently means "in affinity with," or "the same in kind."

ively,—so in other words, they are the *intellectually unconscious* subjects of that moral and rational intuition of which Man is the *intellectually conscious* subject,—the free possessor. What in man is *moral or rational perception*, becomes in the brute mere *natural perception*,—something which he is led to be delighted with, (but merely as his eye is delighted with the light that surrounds him,) by means of the occasional illumination which flows into his animal consciousness, causing him to adopt the perception, and affording at the same time the power of a suitable discrimination, to be brought forth into action.

This humble species of discrimination, *being qualified by the nature of the consciousness*, may, under this view, be more properly designated *natural discrimination*, to distinguish it from what is essentially rational; and thus the analogy which, in the author's opinion, indicates a limited *rationality*, may rather be taken to indicate a perception analogous to, but not in any continued affinity of consciousness with, that of Man. Moreover, the discursive faculty, as limited by Dr. Hancock, would be insufficient for Brutes in their intercourse with Man, in the performance of many of those actions in which Reason is supposed to be the agent; as may be gathered from the examples which I shall presently give of their actions, many of which are performed from an impulse antecedent to that experience which is necessary for ratiocination; in the same manner that many actions are rationally performed by human intelligence without recourse to any mediate analysis: a quick intuitive perception must in many cases be necessary to aid them in the performance of contingent actions, involving a moral and intellectual power;—and to this perception operating with more or less activity and intensity, we may, I think, with propriety refer all such actions as those of which the following is another example taken from Dr. Hancock's catalogue.

“In ‘Instinct Displayed,’ an anecdote is related of a Cat, which by giving timely warning in the best way she could to the Parent of a Child in extreme danger, was the means of saving it from drowning.”*

* See ‘Instinct Displayed,’ Letter 13.

To me therefore, it appears, that such examples as those adduced, prove much more than can be included in the limitation, which the theory adopted by Dr. Hancock respecting the reasoning power of Brutes prescribes; they prove, for instance, that Brutes as well as Man are in the conscious possession of "primitive ideas and rules of true and false," "common sense," and lastly, "moral sentiment," or the emotions which give rise to the knowledge of right and wrong, good and evil—all which are included in the most enlarged sense of the term Reason, as defined by the author in page 226.

In treating of "Education," Dr. Hancock justly says, (p. 292.) "Whatever [impression] is received from without, must have a connatural affinity with some primary taste, capacity, or feeling within."—"Every *internal power* has also its object in its external relations, and external impressions can never produce a practical effect further than they quicken, rouse, and animate the internal power to which they are appropriate and upon which they act." Now if this be true of Man it is also true of Brutes, if a rational consciousness be connected with their acts; and if the internal principles necessary to such acts be thus *rational in the enlarged sense of the term Reason*, the consciousness of the agent must be in a like degree rational. This, however, would be to humanize the Brute, and raise him from that station which is inevitably assigned to him.

Are actions of the nature of the above-mentioned to be referred to that class, of which the author in his definition says—"if there be any actions which are performed with every indication of design, forethought, and wisdom, which are not the result of instruction, nor of individual experience, but of a power acting above the consciousness of the creature, and directing it with unerring certainty to some specific ends, by means far above its comprehension, whether in Man or in Brute; these actions are *instinctive*?"

Or are those and similar acts, forming as Dr. Hancock observes, not *rare exceptions*, or anomalous occurrences, but matters of course,—to be referred to that class to which he refers them when he says, "they do not belong to Instinct," and of which he observes in his definition—"If there be any actions, which evi-

dently result from observation and instruction, indicating an intelligent power of combining means, and adapting them to ends of which the creature is conscious ; these actions come within the province of *Reason* ”? If the latter, then the distinction between Reason defined as a mere discriminating power, and Reason defined as including a superior principle, appears to be lost :—if the former, there is then an end of Brute Reason.

At page 100, it is observed that “there is no more ground for making an essential distinction between those *outward faculties* in man and the brute, which compare ideas in order to draw simple inferences, than for making a distinction in kind between their respective powers of *remembering*. So that if the Brute can remember by his creaturely or animal nature, so may he reason, as far as his limited capacity will enable him to do so, by the same animal nature.” But if it can be shown that the inferences included in the foregoing examples of brute reason are not simple ; but moral, complex, and ingenious ; it will follow that they require a suitable reasoning power to produce them,—a capacity far transcending that which is impliedly assigned to their “animal nature,” at the close of the above paragraph. Such actions cannot therefore proceed from the conscious reason of the agent, unless this be allowed to be a principle superior to that which is defined by the author’s restricted application of the term Reason.

[*To be continued.*]

ART. XI. *The characters and descriptions of several Birds belonging to the genus *Thamnophilus*. By WILLIAM SWAINSON, Esq. F.R. & L.S. &c.*

BEFORE entering upon the immediate object of this paper, I feel it necessary to acquaint the readers of the Zoological Journal, that I am prevented from offering to them in this, or perhaps the next number, the conclusion of my observations on the family of *Laniadæ*. Several new forms have come under my examination, and with others, scattered in private collections, I have yet but an imperfect acquaintance; these may probably throw some additional light upon the imperfect attempt I have made to illustrate this intricate subject.

In the mean time, having the materials before me, I hope to interest our ornithologists by the characters and descriptions of several birds belonging to the American genus *Thamnophilus*, most of which I presume to be undescribed. I say *presume*, because every one who has directed his attention to the investigation of exotic birds, must be aware of the difficulty, not to say the impossibility, in many cases, of ascertaining whether a species is or is not recorded. These difficulties, as may be expected, frequently lead to unavoidable mistakes, particularly among our own zoologists, who have to contend against the many and great disadvantages arising from the want of zoological institutions in this country. How, it may be asked, are we to institute comparisons between subjects only to be found in the well-stored museums of the continent? or how can it be expected we should be intimate with the scientific works there published, when they are not to be found in our public libraries? The private fortune of few, if any, of those who devote themselves to the science, is adequate to supply these numerous and expensive publications. Under such disadvantages, accuracy on this head becomes impossible. A shade of doubt and uncertainty must be thrown upon every question, the bearings of which are not immediately within our cognizance. And although this may impress many persons with an idea that our opi-

nions are feeble and indecisive, still it is the wisest plan that a judicious writer can adopt.

Most of the birds I am about to describe, were collected during my travels in Brazil, in the years 1815 and 1816. Since that time, I have been informed that a sumptuous work on the Zoology of that country has been commenced under the immediate auspices of the Austrian government, and that several other accounts of Brazilian productions, in one form or other, have issued from the presses of Berlin and Vienna. None of these, as far as I can learn, are in this country; so that whether they do or do not contain antecedent descriptions to those which follow, I am quite unprepared to state.

THAMNOPHILUS.

Rostrum validum, compressum, gonyde recurvâ ascendente.
Vibrissæ nullæ.

Alæ breves, imbelles, rotundatæ.

Cauda elongata, gradata vel rotundata, rectricibus fasciculatis, angustis.

Tarsi robusti, squamis lateralibus frequentibus.

General Observations.

The habits of these birds, as well as their scientific history, * have already been alluded to. They may be considered as chiefly inhabiting the tropical regions of the new world, having a range to the north as far as Canada, and to the south as far as Paraguay. It is somewhat remarkable, that from the interior of Mexico, not a single species has reached this country. The immense elevation of the table land on the Mexican Cordilleras, where the temperature closely assimilates to that of the south of Europe, may probably account for this; particularly as we find that the nearer we approach Equinoctial America, the more abundant are the species.

The prevalent colours are black, grey, and rufous, variegated by spots and bands of white, or other light colours. The wing-covers are generally black, tipped by round spots of a snowy white-

* Zool. Journal, Vol. 1. p. 297.

ness. The larger, or typical species, are remarkable for their long and graduated tail; while this part is usually rounded and much shorter in the others, which thereby assimilate to the typical form of the African genus *Malaconotus*.

In a group like the present, where the species often bear a very close resemblance to each other, it becomes essentially necessary to enter into minute details, and to institute comparative characters which in other cases might be thought superfluous.

The sexes, as in the true raptorial birds, vary somewhat in their size, and generally in their plumage, that of the female being lighter; and not unfrequently rufous where the male is black. It would however appear that there are some exceptions to this rule.

The beautiful *Thamnophili* described by that intelligent naturalist Dr. Such, in this Journal, seem all to belong to the typical or long tailed division; while in those which form the subject of this paper, the tail is round. Besides these, two other species have been described by M. Vieillot, two by Dr. Leach, and one by M. Le Vaillant, making a total of nineteen: this number will probably be doubled when the *Laniadæ* of Dr. Latham, amounting to 122 species, are distributed under their modern genera.

** *Cauda rotundata.*

1. *THAMNOPHILUS bicolor.*

Red eyed Bush-Shrike.

T. cristatus, *suprà niger*, *albus infrà*; *tectricium apicibus*, *remigum marginibus*, *caudæque fasciis interruptis albis.*

T. crested, above black, beneath white; tips of the wing covers, margins of the quills, and interrupted bands on the tail white.

Black and white Shrike. Lath. Gen. Sys. 2d. ed. Vol. 2. p. 22.

The red eyed Shrike may be considered as the best example of that division of the American *Thamnophili*, wherein the tail is shorter and less graduated than in the more typical species. Its total length is eight inches. The irides are crimson. The

bill is strong, cinereous-black, and considerably compressed, although somewhat narrowed towards its extremity. The head is conspicuously crested. The ground colour of all the upper plumage (including the ears, sides of the head, and neck), is deep black, and of the under parts pure white: the wings are black, with two bands of white across the tips of the covers; the quills are also margined externally with white. Spurious covers, black. Tail rounded, deep black, with 4—5 interrupted and sometimes obsolete bands of white; the tips of all the feathers are obtuse and white. Tarsi rather long and robust; and in the live bird of a cinereous colour: upper tail covers banded with black and white. The sexes are similar.

I discovered this bird in the interior or Catinga woods of Humildez of the Province of Bahia; frequenting low trees in marshy situations, within which it seeks its food. Although common in that vicinity, it was a species (in 1817) unknown to any of the Brazilian zoologists. In that year I sent two or three specimens to England, one of which fell into the hands of Mr. Bullock, and has been described by Dr. Latham, in his new edition. His account however is somewhat imperfect; inasmuch as he takes no notice of the crest, or of the white margins on the quill feathers. An injured specimen of this bird is also in the British Museum and has the tips of the wing covers yellowish, but whether this is natural, or the effect of time on the dried bird, it is impossible to say. Total length, 8 in. bill $1\frac{1}{10}$. wings $3\frac{4}{10}$, tail $3\frac{1}{2}$. tarsi $1\frac{3}{10}$.

2. *THAMNOPHILUS cinnamomeus*.

Cinnamon Bush-Shrike.

T. cristatus, *suprà cinnamomeo-fuscus*, *albus infrà*; *tectricibus striis 2 angustis, fuscis, fasciatis*.

T. crested, above cinnamon brown; beneath white; wing covers with two narrow, dusky, bands.

Like the last, this is remarkable for its simple colouring; in size, shape, and proportion they likewise agree, except that this, from the tail being more rounded or graduated, is more allied to

the first division of the group; the bill is likewise a trifle smaller, and is blackish brown. The *Head* is conspicuously crested; the whole of the *upper plumage*, including the wings and tail, are of a clear and uniform ferruginous or cinnamon colour; the *wing covers* above are marked by a narrow dusky line, close to their extremities, which are somewhat brighter, and the same may be observed on the lateral *tail feathers*, the ends of which are somewhat pointed. All the *under parts* are white; slightly tinged with ferruginous on the sides. Inner web of the *Quills* brown. *Tarsi* long, robust, and pale.

Total length about $8\frac{1}{2}$, bill, $1\frac{2}{10}$, wings, $3\frac{2}{10}$, tail, $3\frac{4}{10}$, tarsi, $1\frac{2}{10}$. But for the circumstance of both my specimens being labelled *males*, I should have been inclined to suspect these birds to be the females of *T. bicolor*. They were however found in a different part of the country, and on referring to my notes, I observe that at Humildez, where *T. bicolor* was very common, I never met with *cinnamomeus*.

I was never able to procure more than two specimens of this rare bird, both of which were males. They were shot in the forest of Urupè, in the province of Bahia. A third specimen is in the British Museum.

3. *THAMNOPHILUS fasciatus*.

Barred Bush-Shrike.

T. supra rufus, infra nigro alboque fasciatus; vertice maris nigro, fæminæ rufo.

T. rufous above; beneath banded by black and white; crown in the male black, in the female rufous.

Barred Shrike. Latham, Syn. 2d Ed. Vol. 2. p. 87.

A comparatively small species, not exceeding the size of a Sparrow. The bill is strong, and unusually thick; its colour is black with the margins pale. In the *females* the crown of the head (which is slightly crested,) together with all the *upper plumage*, is of a deep and bright rufous: the wings and tail are the same, and unspotted; the *sides of the head* are black, freckled

with minute white dots. All the under plumage, from the chin to the vent, is crossed by numerous narrow bands of deep black and white, arranged alternately. In the *male* these bands are carried quite round the upper part of the neck, but in the *female* they are, in this part, almost obsolete. The *male* is further distinguished by the crown being glossy black and unspotted. The *tail* is moderate and rounded, but the ends of the feathers are not very obtuse, as in *T. bicolor*. *Tarsi* moderate, cinereous. Inner wing-covers fulvous, banded with black lines.

Total length $6\frac{1}{2}$, bill $\frac{9}{10}$, wings $2\frac{1}{4}$, tail 3, tarsi $\frac{9}{10}$.

OBSERVATIONS.—This seems a common bird, having been sent from different parts of Equinoctial Brazil. I met with it in abundance on the skirts of the forest of Urupè, frequenting low bushes and trees, and feeding upon coleopterous and other insects found among the foliage. Specimens of both sexes are in the British Museum.

4. *THAMNOPHILUS torquatus*.

Rufous winged Bush-Shrike.

T. griseus, infra albescens; jugulo pectoreque lincis nigris fasciatis; alis rufis, immaculatis; caudâ nigrâ, rotundatâ, albo maculatâ.

T. greyish, beneath whitish; throat and breast banded by black lines; wings rufous, immaculate, tail black, rounded, spotted with white.

Habit of the Barred Shrike, but smaller, measuring only five inches three-quarters; its *bill* is less, and is likewise more compressed. The *crown*, which is not crested, is covered by a deep black patch, paler in front, and extending to the hind head. The prevailing tint of the *upper plumage*, and also the sides of the head, neck, and flanks, is cinereous grey. The *wings* are alone rufous, and unspotted; the *tail* is rounded, the feathers narrow, slender, and obtuse at their extremities; the middle pair wholly black, the rest more or less crossed by interrupted bars of white, and tipped with the same colour. The *throat*, sides of the head,

and middle of the *body* are whitish, and unspotted; but round the *breast* are ten or twelve transverse bands of black lines. *Tarsi* rather long and cinereous. *Irides* crimson.

Total length $5\frac{1}{2}$, bill $\frac{9}{16}$, wings, $2\frac{1}{2}$, tail, 2, tarsi, 1.

OBSERVATIONS.—Found in the same situations as *T. fasciatus*, but infinitely more rare. I never met with the female.

5. THAMNOPHILUS *nævius*.

Spotted Bash-Shrike.

T. supra cinereus, infra pallidior; vertice nigro; rectricium nigrarum obtusarum apicibus albis; rectricæ externæ maculâ albâ marginali fasciatâ.

T. above cinereous, beneath paler; crown black; tail feathers black, obtuse, tipped with white, the outer feather with a white marginal spot.

Spotted Shrike. Latham. Syn. 1st Ed. 1. 190.

Lanius nævius. Gm. 308. Ind. Orn. 1. 81. 51.

Le Tachet.—Le Vail. Ois. d'Af. 2. Pl. 77. f. 1.

Lanius nævius. Shaw, Gen. Zool. 8. 2. 325.

————— Leach, Zool. Mis. tab. 17.

Lanius punctatus. Shaw Gen. Zool. 8. P. 2. p. 327.

This species, originally described from a specimen in the British Museum, requires elucidation. Dr. Latham, and after him, Dr. Leach, have both said that the upper plumage is black;—this however is an oversight, for by a reference to the Museum specimen, I find the *ground colour* of the upper parts to be dark cinereous; the *crown* black, and a spot of the same colour on the *back*, where the concealed part of the feathers are also variegated with white. The *wings* are black, the inner covers white, the lesser covers spotted with white, and the *under plumage* pale cinereous; tail-covers black, tipped with white; the *tail* is rounded, the feathers obtuse, and tipped with white; the outer feather on each side is alone marked by a central white spot across their exterior webs. In this character, as well as in the less robust form of its bill, and its comparatively short tarsi, it differs from *T. pileatus*, while

from *T. ambiguus* it may be also known by its shorter tarsi, and by not having *all* the tail feathers marked by a pair of white oblong spots.

The Trachet of Le Vaillant seems to be, without doubt, the same species as the *L. navius* of Latham and Leach, the form and colour of the tail in both perfectly agreeing. Dr. Shaw has, however, made the Trachet into a distinct species, adding gratuitously, that the feathers of the head are lanceolate.

Length of the wings $2\frac{1}{2}$, tail 2, tarsi scarcely $\frac{1}{4}$.

Var. α ? *T. ambiguus*.

T. supra cinereus, infra pallidior; vertice nigro; remigum nigrorum margine albo; rectricium obtusarum apicibus fasciâque interruptâ albis.

T. above cinereous; beneath paler; crown black, quills black margined with white; tail feathers obtuse, the tips and a central interrupted band, white.

Two birds brought to England from Minas Geraes by Dr. Such, are now before me, agreeing in general disposition of colours with the last, yet presenting certain characters which may prove important.

Their size is, in a trifling degree larger; the quills are deep black margined externally, (except at their base) with white; the tail is half an inch longer; but, from the length of the coverts, it appears very short; it is black, rounded, tipped with white, and obtuse; each feather in the middle having a pair of large snowy oblong spots adjoining their margins; the *tarsi* are one-tenth of an inch longer, and the *inner wing-coverts* yellowish white, spurious quills black.

Total length about $5\frac{1}{4}$, bill $\frac{1\frac{1}{2}}{10}$, wings $2\frac{6}{10}$, tail $2\frac{1}{2}$, tarsi $\frac{9}{10}$.

+ Var. β ? *T. pileatus*.

T. supra cinereus, infra pallidior; uropygio pectorisque lateribus fulvis; vertice nigro; remigum fuscorum margine testaceo; rectricium acutarum apicibus lineâque marginali albis.

T. above cinereous; beneath paler; rump and sides of the breast fulvous, crown black, quills brown margined with fulvous; tail feathers pointed, tips and marginal line white.

Closely allied to the last in size, and in general colouring, the bill however is a little shorter, and the feathers across the back and those on the rump are tinged with obscure fulvous. The wings are brown, the greater are slightly margined with whitish, the latter with dull ferruginous, and the scapular quills with a broad base of white. The tail seems longer than the last, it is rounded, black, and tipped with white; all the feathers are *pointed* at their extremities, and this in so regular a manner, as to appear perfectly natural; the margin of each has a central line of white, longer, narrower, and less conspicuous than in the last. The tarsi are a trifle longer than in *T. ambiguus*, and near a quarter of an inch longer than in *nævius*.

Total length 6, bill $\frac{1}{2}$, wings $2\frac{7}{16}$, tail $2\frac{1}{2}$, tarsi $\frac{9}{16}$.

OBSERVATIONS.—Inhabits the Catinga (or interior) woods of Bahia: the only specimen I possess is a male.

Two of the preceding descriptions were drawn up from single birds. I therefore feel much difficulty in forming an opinion whether they are varieties of one species, or distinct in themselves. The slight variation in their colours (consisting principally in those of the tail) is a matter, in itself, of little consequence; but the difference in the comparative length of their tarsi cannot be so easily reconciled. It may also be observed, that the pointed form of the tail-feathers in *T. pileatus*, is opposed to the rounded form of those in *nævius* and *ambiguus*. The question is interesting, but cannot, I think, be decided, until more specimens are examined. In the mean time they can either be considered as varieties or species.

6. *THAMNOPHILUS ferrugineus*.

Rufous crowned Bush-Shrike.

T. ferrugineo-fuscus, infra pallide fulvus; vertice rufo; alis fuscis; maculis dorsum tectriceque ornantibus albis; rectricium ruforum apicibus obtusis.

T. ferruginous-brown, beneath pale fulvous; crown rufous; wings brown; spots on the back and wing covers white: tail feathers rufous, the tips obtuse.

Allied in habit to *torquatus*, but the bill is deeper, the wings longer, and the tarsi shorter. The general size of the bird is also somewhat larger. The ground colour of the *upper plumage* is ferruginous brown, the top of the *head* bright rufous, and its sides greyish. The feathers in the middle of the *back* are snowy white towards their tips. The *wing-covers* are blackish brown, tipped with white, which colour forms two bands: the *scapular quills* are blackish, with broad white margins: the rest of the *quills* are brown, margined with ferruginous and whitish. All the *under plumage* is ferruginous or fulvous white, lightest on the chin and in the middle of the body. The *tail* is short, slightly rounded, and dark rufous black; the lateral feathers tipped with white; the outer pair only having an additional white spot on their external margins; the tips of all are abruptly rounded. The feathers on the lower part of the back are remarkably long.

Tarsi moderate, cinereous. *Irides* hazel.

Of this species I have two specimens, from the same locality as the preceding. One is marked as a male bird, but with some doubt: of its history, in other respects, I know nothing.

Total length 6, bill $\frac{1}{4}$, wings $2\frac{1}{4}$, tail $2\frac{1}{2}$, tarsi $\frac{1}{10}$.

ART. XII *Descriptions of some Shells, belonging principally to the genus Chiton, observed on the Coast of Argyleshire in the Summer of 1824. By R. T. LOWE, Esq.*

CHITON, Lamarck, Sowerby.

SINCE the days of Chemnitz, little addition seems to have been made to the knowledge of this neglected genus, if we except the occasional notice of a few new and well-marked foreign species. In the "Animaux sans vertebres" of Lamarck, only five species are recorded, and no attempt is made towards elucidating the history of those that had been described by preceding authors. It is not therefore surprising that amongst the improvements and discoveries of modern science, the genus Chiton should present to the Conchologist a source of so much perplexity and doubt,

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that the present attempt to identify a few British species will, I fear, on my part, appear not a little presumptuous. My object will however be attained should I succeed in drawing to the subject the attention of some one better qualified than myself for such an undertaking.

Though considerable obscurity appears to extend in some measure over *all* the species of this intricate genus, the greatest confusion exists amongst the British species. In some instances indeed, it has become almost impossible satisfactorily to reconcile the discordant synonymes and more discordant descriptions by various authors, of the same individual species. This, perhaps, is not so much owing to the inaccuracy of the descriptions themselves, as to the insufficiency of those characters on which most writers have grounded their specific distinctions. Great uncertainty has also necessarily arisen from the deficiency of all the hitherto published figures of the less striking species of this genus;—an imperfection doubtless to be attributed to the difficulty of expressing those minute but essentially important characters on which alone the permanent specific distinctions of these shells must rest. The figures in the work of Martini and Chemnitz, are certainly as characteristic in *habit* of the shells they are intended to represent as the nature of the work would authorise us to expect: but any one will be ready to acknowledge their deficiency, in every particular of minute detail or delicacy of execution.

As far as the British species are concerned, little more can be said in favour of the figures in Wood, Pennant, Montague, the Linnæan Transactions, &c. The only exception to these remarks I have met with, is the figure of *Chiton lavis*, in an unpublished plate engraved for Leach's Brit. Mollus. This might indeed almost serve as a model for future artists; and in accuracy and delicacy of delineation cannot perhaps be well exceeded.

Under these circumstances, and without the opportunity of comparing my species with authentic specimens of those hitherto described as British in this intricate genus, I have found extreme difficulty in reconciling the discrepancies, and arranging under their proper types, the imperfect descriptions of different authors.

But even with this disadvantage, I have so much confidence in the permanency of those characters on which I propose to rest the distinctions of the species, that I have ventured to believe something might be added to the present stock of conchological knowledge, by the publication of the few well characterized species in my possession.

The idea of dividing the Genus into sections from the characters of the marginal ligament, has been borrowed from the article on Conchology in the Supplement to the Encyclopædia Britannica. The obvious and convenient arrangement of the species it affords, certainly entitles it to the highest consideration.

The presence or absence of granulations, striae, and punctures; and the different modifications and arrangement of these on the valves, are the most constant as well as the most obvious characters for specific distinctions. The next in importance to these I consider to be the *general* formation and number of the marginal teeth of the valves. On an exact coincidence in the *number* of these in each valve through every individual of the same species, I am not much inclined to rely; nor should I feel at all disposed, in the absence of other characters, to consider differences of this nature sufficient for specific distinction. As far however as my observations have gone, I have constantly found a peculiar formation of the marginal teeth accompanying other important and unquestionable specific characters, and remaining constant in all the individuals of each species in my possession. In the middle valves, the number and peculiarity of formation of these teeth will probably be found more constant and regular than in the first and last.

The principal objection I am aware of to the employment of such a character for specific distinction is this:—the marginal teeth being entirely concealed by the ligament, it becomes necessary to remove the latter before the species can be completely ascertained.* In all cases it is desirable to simplify as much as

* In dead specimens, a few minutes immersion in warm water will render the marginal ligament sufficiently pliable to bear removal; but care must be taken not to injure the teeth, which are rather brittle. The best method is at once to sacrifice a single specimen of each species; and, having completely

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possible, and the more obvious characters, when sufficient, ought always to be preferred. There is something also of an artificial nature in this character, which has determined me to consider it as subordinate to those I have just mentioned; and to exclude it from the specific phrase, though not absolutely from specific description. In some instances, indeed, it will be found of the greatest use in confirming distinctions which might otherwise appear mere accidental modifications.

All characters founded on colour have been rejected, as obviously uncertain; though even in this there is a peculiarity of habit observable in most individuals of a species. Differences in shape, in shells like these, so much allied in general outline, are extremely difficult to define, and will not I fear be found to afford sufficiently striking peculiarities for specific character.

The fringe, which by some writers has been relied on with so much confidence in the description of *Chiton cinereus*, is, with different modifications, common to all the species; though it is certainly much more conspicuous in that than in any of the others, with the exception perhaps of *C. fascicularis*.

I have not yet been fortunate enough to meet with any Chitones having fewer than eight valves; but I should imagine there can be little hesitation in considering all such as mere accidental varieties.

* LIGAMENTO MARGINIS SPINOSO.

1. *Chiton fascicularis*.

C. testâ subcarinatâ; valvulis carinâ longitudinaliter striatâ, lateribus granulatis; margine granuloso, subspinoso, rudi, setarum fasciculis utrinque.

Valvuli medii dentibus 2 utrinque, primo maximo, altero parvo. Valvulus 1^{mus} dentibus 6, latoribus; ultimus utrinque emarginatus, interstitio fere crenulato, aliquando dentato.

Icon. Chem. Coch. 10. t. 173. f. 1688.—Encyc. Meth. pl. 163. f. 15.—Adans. Hist. Sen. p. 42. t. 2. f. 11?

removed the ligament, to fasten each valve separately in their proper order on a card, with gum, by their outside, when the teeth may be conveniently observed.

Dorset Cat. p. 1. f. 1. (*malè*).—Wood's Gen. Conch. pl. 2. f. 6.
—Linn. Trans. VIII. p. 1. f. 1. (*malè*).—Mont. Test. Brit. pl. 27.
f. 5.—Sowerb. Gen. Chiton. f.—Leach's British Moll. (ined.)
pl. X. f. 8.

Linn. Syst. Ed. 12. p. 1106. No. 4.—Linn. Gmel. p. 3202.
(*sic* Linn. Trans). Lamarck, Anim. 6. p.

Shell less carinated and convex than in the next species. Valves with a few longitudinal striæ down the middle, which are very often obliterated by the decortication of the valves; their sides coarsely granulated. The first and last valves are without the longitudinal striæ down their centre, but are granulated all over. The granulations are coarse, elevated, obtuse, distinct to the naked eye; larger than in any of the following species. Margin coarsely granulated, more or less spinous, furnished with tufts of grey bristles rather than hairs, placed at the interstices of the middle valves, and also round the first and last. The marginal teeth of the last valve are variable; sometimes there are two notches on each side, and the intermediate space crenulated; and sometimes these crenulations are so deep that it would perhaps be more proper to describe the last valve as toothed in the middle to within a short distance of either extremity. Colour cinereous or dark olive; sometimes nearly white by decortication. Fringe of the margin bristly, very distinct. Length from a quarter to three quarters of an inch. Breadth about half the length.

Oban, Argyleshire; not very common. Appin, not unfrequent. It is rather extraordinary there should not be a single good representation of a British specimen of this common species. The best is that in Leach's British Mollusca, though the tufts on the margin are not well expressed.

** LIGAMENTO MARGINIS STRIATO.

2. Chiton lævis.

C. testâ carinatâ, elevatâ, convexiore; valvulis lævigatis, politis (sub. lente) minutissimè granulatis; margine lato expanso, exilissimè reticulato.

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Valvuli medii dentibus 4 utrinque, primo majore.

Valvulus 1^{mus} dentibus 20, parvis.

Icon. Tab. nost. V. f. 1.—Penn. Brit. Zool. 4. t. 36. f. 3; Ed. 1812. pl. 39. f. 3. (fide Linn. Trans. and Turton).—Leach's Brit. Moll. ined. pl. X. f. 7 (*optime*).

Linn. Gmel. p. 3206 (fide Linn. Trans).—Mont. Test. Brit. p. 2.—Linn. Trans. VIII. p. 21. No. 5.—Wood's Gen. Conch. p. 22.—Turton's Conch. Dict. p. 33.

var? *C. septemvalvis*, Mont. Test. Brit. p. 3. (*C. discors* of Linn. Trans.)

Shell raised, elevated, rather convex, keeled. Valves slightly beaked, to the naked eye smooth, shining, polished, with irregular striæ of growth. When seen through the lens they are found to be distinctly and regularly, but very minutely granulated; the granulations disposed in quincunxes. Margin very broad, expanded, finely and regularly reticulated; the meshes of the reticulations raised and shining. Fringe very short, indistinct. Colour fine deep red, or rufous brown; sometimes mottled with green, and often decorticated and encrusted. Margin often with alternate stripes or patches of red and white. Fringe deep red. Length from one quarter to three quarters of an inch. Breadth half the length.

Found at Oban, adhering to rocks at Spring tides. Rather rare.

It was not without much hesitation that I was at length induced to consider this shell as the *C. lævis* of authors. I am now however clearly of opinion that the granulations of the valves, from their minuteness, escaped the observation of the accurate author of the Test. Brit. and other writers. This decision is satisfactorily confirmed by the inspection of specimens in the collection of the Cambridge Philosophical Society, named, as I am informed by Professor Henslow, by Mr. Lyon of Tenby.

If *C. punctatus* of Turton's Conch. Dict. p. 34. f. 10. be really *punctured*, it must be distinct from this species; and cannot be the obscure *C. punctatus* of Linnæus, p. 1107. No. 6, which also is described "*punctis excavatis*," since the figure in Seba referred

to by Linnæus, represents a shell with a scaly margin, as I have myself had an opportunity of ascertaining. I am much inclined however to consider Turton's shell as a more accurately observed specimen of *C. lævis*. Amongst my specimens there is one which being a good deal decorticated in some places, shews immediately under the outer granulated layer an internal shelly coat of a porous or reticulated structure, resembling the punctured part of a thimble.* Without further data I have not ventured to determine this question, but trust these observations will lead to some elucidation of the point from others more competent to decide.

C. septemvalvis of Montagu if not a distinct species, being described with a reticulated margin, ought certainly to be referred to this rather than to *C. marginatus*.

The synonymes of this very distinct species have been united by Mr. Dillwyn with those of *C. cinereus*, of which he considers it merely a variety. The only way of accounting for this, is by supposing he mistook it for the reddish variety mentioned by authors of *C. cinereus*, or perhaps *C. ruber* of this paper; and that he was not in possession of the true *C. lævis*. His reference to Adanson, t. 2, f. 11, p. 42, must certainly be expunged. The shell there represented is probably *C. fascicularis*.

*** LIGAMENTO MARGINIS RUGOSO, SC. FARINOSO AUT GRANULOSO.

3. Chiton cinereus.

C. testâ carinatâ, ovatâ; vulvulis regulariter granulatis; margini farinoso, distinctè fimbriato.

Valvuli medii dentibus 2 subæqualibus utrinque.

Valvulus primus dentibus circiter 10; ultimus 12.

Icon. Chemn. Conch. 8. t. 96. f. 818.—Barn. Test. Mus. Cæs. p. 5. t. 1. f. 3. (sive Chemn).—Wood's Gen. Conch. p. 3. f. 4. (referred to in the text for *C. marginatus*).—Dorset Cat. pl. 1. f. 4.—Encyc. Meth. pl. 161. f. 11. (*malè*, the valves not beaked).

* I have since observed the same appearance in a very young decorticated specimen of *C. latus*. May it not be common to all the species?

Linn. Syst. Ed. 12. p. 1107. N^o 9.—Barn's Index Mus. Cæs. p. 1 & 2. (fide Chemn.)—Mont. Test. Brit. p. 3.—Turton's Conch. Dict. p. 34.

Shell ovate, a little broader behind. Valves beaked, very distinctly and regularly granulated. Colour generally uniform cinereous, sometimes dark olive, mottled or tawny yellow. Margin powdery, generally of the same colour as the shell, but sometimes mottled with white. Fringe very distinct, brown. The first and last valves are marked inside with arched or radiating white lines or striæ, running up from the interstices of the teeth. Length in general about $\frac{1}{4}$ of an inch. Breadth about $\frac{1}{2}$ the length. The largest specimens I have seen (in the collection of the Cambridge Philosophical Society) are about $\frac{1}{4}$ of an inch long.

Very common on stones and dead shells at Oban, Appin, &c. It seems particularly to abound where *Patella testudinaria* is most plentiful. I have omitted the synonyme of Fabricius referred by Chemnitz to this species. From the circumstance of Fabricius' shell being described as "*testa lævi; limbo subciliato, and corpore rubicundo,*" I think it accords much better with the next species.—The true *C. cinereus* is described by Born as having "*valvæ granulosa;*" and by Linnæus as "*non glabra.*" I have never yet met with any specimens of the true *C. cinereus*, to which the phrase "*corpore rubicundo,*" could be properly applied, but it answers very well to the following species.

The shell described and figured under this name in the 8th Vol. of the Linn. Trans. is certainly not the *C. cinereus* of Linnæus and Born. For exactly the same reasons as in the case of Fabricius, with the additional one of the broad margin, I have referred it to the following species, of which the figure is an excellent representation.

The references in the text of Wood's Gen. Conch. to fig. 4 and 5, of pl. 3, I am convinced have been accidentally reversed. Fig. 4, referred to for *C. marginatus*, is a very good representation of the common sized specimens of *C. cinereus*, and the other presents something of the broad outline of my *C. latus*.

4. *Chiton ruber*.

C. testâ carinatâ; valvulis lævissimis, nitidis; margine lato, farinoso.

Valvuli medii dentibus 2.

Valvulus 1^{mus} dentibus 9; ultimus 10.

Icon. Tab. nost. V. f. 2.—Chemn. Conch. t. 96. f. 813.—*Encyc. Meth.* pl. 161. f. 6.—Linn. Trans. VIII. p. 22. N° 6. t. 1. f. 3. (*C. cinereus*).

Fabr. p. 423.—Laskey in Wern. Trans. ?

Colour bright red, or rarely tawny rufous; mottled.

On rocks and stones, Oban; rare. I also found two specimens at Filey, on the Yorkshire coast, on rocks south of the bridge, in the Summer of 1823.

Shell perfectly smooth and polished, shining; without the least appearance of granulations or punctures under the lens, but marked with irregular, faint, transverse, arched striæ of growth, which are obsolete in their transverse, and stronger on their sides in their longitudinal direction. Margin broad as in *C. lævis*. Besides these essential differences, it may at once be distinguished from *C. cinereus* by its habit and colour, which in all my specimens is a bright mottled red or tawny. It is frequently partially encrusted with a black extraneous substance. The fringe is also less distinct than in *C. cinereus*, and is light red. From *C. lævis* it is abundantly distinct, in not having the reticulated margin or granulated valves.

The figures referred to by Chemnitz, and the *Encyc. Meth.* are very imperfect in detail, though there are some characteristic marks. That of the Linn. Trans. is excellent. This species has long been involved in much obscurity, and seems to have caused great confusion amongst English writers. It is probably the shell slightly mentioned by Capt. Laskey, and has no doubt been often overlooked as a variety of *C. cinereus*.

5. *Chiton Asellus*.

C. testâ subcarinatâ; valvulis longitudinaliter concatenato-granulosus, vel striis longitudinalibus moniliformibus; margine granuloso.

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Valvuli omnes edentuli, sed marginibus minutissimè crenulatis.

Icon. Testa jun. tab. nost. V. fig. 3. a. Aucta. fig. 3. b.—Chemn. Conch. 8. t. 96. f. 814. *Chiton minimus*.—Icon. Testa sen. tab. V. nost. f. 4.—Chemn. Conch. 8. t. 96. f. 816. *C. Asellus*.—Encyc. Meth. pl. 161. f. 12.

Shell scarcely so sharply carinated as in the following species. Valves slightly beaked, with moniliform or chain-like granulations, disposed in longitudinal striæ, giving the shell an elegant appearance when seen through the lens. Marginal ligament with black granulations like shagreen. All the valves without marginal teeth, their edges inside minutely crenulated or granulose. Fringe short. Ground colour of the shell light chocolate; in young specimens the posterior edges of the valves are dark brown or black, which extends over about half the valve; giving the shell the banded appearance represented in Chemn. fig. 814. In older specimens this colour becomes deeper, and extends gradually over the whole of that part of each valve which is uncovered by the preceding as the shell contracts in drying.

I have very little hesitation in uniting under this species the *C. minimus* and *Asellus* of Chemnitz. The peculiarity of colouring in the latter is exactly what is observable in the older shells of my specimens, with the exception of the yellowish spots on the back, which merely are not sufficient to authorize considering it a distinct species. This opinion is confirmed by the figure of *C. Asellus* in the Encyc. Meth., in which the longitudinal striæ are represented, which are the distinguishing mark of the species. These are so obscure in the very young specimens, (of which I have some not more than a line in length), that they might easily be overlooked by Chemnitz in his *C. minimus*. These have also something of the mealy appearance which he ascribes to that shell, though not sufficiently to warrant the character, "sprinkled with meal in patches," which has been formed from his description.

Found at Oban and Appin, more plentifully at the latter; low down on the rocks at spring tides below Captain Carmichael's house, where dead shells of *Pecten islandicus* were also abundant. Rare.

6. *Chiton Aselloides*.

C. testâ carinatâ; valvulis (sub lente) minutissimè granulatis; margine rugoso-granulato.

Valvuli medii dentibus 2 utrinque.

Valvulus 1^{mus} & ultimus dentibus 11 aut 12.

Icon. Tab. nost. V. f. 5.

Shell carinated; the valves slightly beaked, minutely, but regularly granulated over their whole surface, not at all in a beaded manner. Margin coarsely granulated; the granulations raised, black. Colour dark chocolate brown or black; the ridges, edges, and interstices of the valves lighter or yellowish white. Fringe very short and indistinct. Length rather less than $\frac{1}{2}$ an inch; breadth about half the length.

Oban, Appin; found with the last. Very rare.

Though in general colour and appearance this species approaches near to the preceding, the dark colour even of the younger shells seems to be more equally diffused over the whole of each valve. They have not consequently in so decided a manner, that banded appearance which is the striking peculiarity of Chemnitz's figure 814.

The presence of marginal teeth in this species is a very satisfactory and remarkable confirmation of its being distinct from the preceding species.

**** *LIGAMENTO MARGINIS LÆVIGATO.*

7. *Chiton latus*.

C. testâ subovato-oblongâ, latâ, carinatâ; valvulis lævigatis politis, (sub lente) minutissimè granulatis; margine simplicissimo, lævi.

Valvuli medii dentibus 2 utrinque.

Valvulus 1^{mus} dentibus 9, latis; ultimus 8, latis.

Icon. Tab. nost. V. f. 6 & 7. Ency. Meth. pl. 161. fig. 9 & 10, Wood's Gen. Conch. pl. 3. f. 5. (excl. descrip. & synon.)?

Mont. Test. Brit. p. 1. (C. marginatus), excl. synon.

Shell strong, broad, slightly ovate, rather wider behind than before, carinated. Valves beaked, smooth, shining; when seen through the lens minutely granulated. Marginal ligament perfectly smooth, simple, without the least powdery appearance or reticulation. Fringe very short and indistinct. In the number of the marginal teeth this species approaches nearest to *C. ruber*.

Colour dark rufous olive, mottled; sometimes approaching to a dark slate-colour; generally with a rufous or tawny tinge.

Length rather more than an inch; breadth about $\frac{2}{3}$ of the length.

From Oban; on the under side of loose rocks on the beach, (about 50 yards south of the Custom-house,) which are only uncovered at spring tides. Also at Appin, Captain Carmichael.

Whether this shell is the real *C. marginatus* of Pennant and others, I have found it impossible to determine. I have little doubt in asserting my opinion that it is the shell described under that name by Montagu. His description is perfectly consistent, as far as it goes, with my shell; and his observation under *C. lævis* of the breadth of his *C. marginatus*, and the remark that it wants the serrated edge and reflected margin of Pennant's *C. marginatus* confirm this idea.* The latter character however has at once the appearance of being a very doubtful one, probably only owing to the contraction of the margin in dried specimens, and to be seen in most of my specimens of *C. latus*;—and the first of the serrated margin has not at all the air of a distinguishing character, at least, if I am right, in supposing it to mean the ligamental margin.

The figure in Argenville t. 25. f. M, referred to by Wood for *C. marginatus* is certainly nothing but a large specimen of *C. cinereus*, and does not present any of the characters just mentioned. The figure given by Wood himself for *C. marginatus*, I have referred without any hesitation to *C. cinereus*; and if I am right in supposing a mistake to exist between the two references, (as explained under *C. cinereus*,) his figure 4 will be a tolerable representation of my *C. latus*. The figure of the Ency. Meth.

* Further confirmation as to locality is to be found in an observation on this species in the Supplement to Test. Brit. mentioning that the separate valves have been found on the Scotch Coast half an inch wide (the general size of my specimens.)

(without a name, and to which I can find no reference in any author), is a most excellent representation of my shell.

Under these circumstances, I should not have hesitated in considering this shell the true *C. marginatus* of most authors, if it were not for the observations on the genus Chiton in the Article Conchology of the Supplement to the Ency. Brit., which is I believe from the pen of Dr. Leach. I there find a shell called *C. marginatus* placed along with *C. ruber* and *cinereus* under the section "Marginal ligament rough;" and another called *C. lævigatus* in the section "Marginal ligament smooth." Now as there is not perhaps sufficient account of the ligament in any of the descriptions yet published of the true *C. marginatus*, and little dependence on the strict accuracy of application of the word "*lævi*" to this part, I feel myself bound in deference to the accuracy and opinion of Dr. Leach, to conclude I am still not in possession of the true *C. marginatus*; and rather to consider my shell as identical with his *C. lævigatus*:—though as his shell does not appear to have been yet published with any specific character, it would not certainly be advisable to adopt the same name. I have therefore given it one expressive of the most obvious peculiarity of its characters. Of course this name must be abandoned, should my shell be satisfactorily identified with the true *C. marginatus*; and the other synonymes restored.*

TEREBRATULA, Lamarck, Sowerby.

8. Terebratula costata.

T. testâ subtenui, lyræformi, planiusculâ; costis longitudinalibus rotundatis scabriusculis pectinatâ; margine dentato.

Icon. Tab. nost. V. f. 8 & 9. Aucta, fig. 9. b.

* Since writing the above, I am more inclined to believe the preceding species distinct from the true *C. marginatus*, by finding in Lamarck no reference under that species to the strikingly characteristic figure of my shell in the Ency. Meth. He adopts the original specific character of Gmelin for his *C. marginatus*, describing from a shell communicated by Dr. Leach; and only quotes "Pennant, 4. t. 36. f. 2. and Linn. Trans. 8. p. 21. t. 1. f. 2." for his synonymes.

Shell rather thin, semi-transparent, flattish, lyræform, narrow at the summit, suddenly spreading in breadth towards the outer margin. Upper valve semi-cordate, inequilateral, flattish; the beak slightly produced, rounded, truncated horizontally to form the perforation, which is large, and completed by the point of the umbo of the lower valve. Lower valve rounded, flattish, slightly elevated in the middle. Both valves are regularly pectinated with longitudinal, rounded, somewhat scabrous ribs, which are interrupted by a few irregular, transverse striæ of growth, giving them something of a vaulted or scaly appearance. Margin of both valves without the least sinuosity, regularly rounded and toothed. Colour towards the beaks an obscure reddish brown, gradually becoming fainter towards the margin which is yellowish white. Inside yellowish white. Animal bright orange-red. Pedicle orange, terminating in a short tuft of brown fibres by which it attaches itself to the rocks. Length rather more than $\frac{3}{16}$ of an inch; breadth rather less:—that is, the shell is $\frac{1}{18}$ of an inch longer than broad.

Found by M. J. Berkeley, Esq. attached to the under side of a loose rock on the beach laid bare by a remarkably low spring tide, about 50 yards south of the Custom-house at Oban. In the same place I found *Chiton latus*, *Emarginula conica* in abundance, *Fissurella græca*, *Voluta alba* of Turton's Conch. Dict., and a number of other interesting shells which are only to be obtained by turning over the broken rocks that lie on the beach and are exposed by low spring tides. I never succeeded in obtaining a second specimen of the Terebratula.

This species appears to me perfectly distinct from *T. Caput-Serpentis* of Lamarck and Chemnitz, as I have satisfactorily ascertained by comparison with a specimen obligingly lent me by Mr. G. B. Sowerby. It is distinguished by not having the slightest sinuosity in the front margin, or depression in the upper valve running from the beak to the margin; by its regular ribs instead of striæ, and strongly toothed margin. Its general appearance and shape are also very different; and the perforation is perfectly horizontal, not oblique as in *T. Caput-Serpentis*, though this is not perhaps any certain distinction. It approaches much more in general appearance the shell figured in the Ency. Meth. pl. 246,

f. 3. a. b. ; but that shell is at once distinguished by its very small perforation which is not completed by the beak of the upper valve.

TURBO, Lamarck.

9. Turbo margarita.

T. testâ læviusculâ, umbilicatâ, nitidâ; sub lente striis circularibus tenuissimis obsoletis; spirâ brevi, apice obtuso.

Icon. Tab. nost. V. f. 10 & 11. Aucta, fig. 11. b. Laskey in Wern. Trans. I. pl. 8. f. 5. (*Helix margarita*.)

Mont. Suppl. p. 147. Turton's Conch. Dict. p. 229.

Shell rather strong, semi-transparent, subglobular; beneath flatish, umbilicated; with four convex, rounded volutions. Spire short, moderately produced; the extreme apex depressed, flattened, obtuse. Body volution beneath convex, rounded. To the naked eye the shell appears perfectly smooth and shining, but through the lens it is found to be marked with very faint, regular, circular, depressed (?) striæ, which are more perceptible on the under side. Aperture round, a little angular at the upper part and slightly attached to the last volution, so that the shell does not appear to have any true columella as in the common *Paludina vivipara*, *tentaculata* and many other shells. Umbilicus moderately large, open, deep. Operculum horny, rounded. Margin of the outer lip simple, entire. Colour a sort of livid bronze, or reddish slate-colour, darker towards the apex. Aperture silvery within. The whole shell in some lights reflects metallic colours.

At Gallanch, three miles south of Oban, rare. At Appin plentifully amongst loose rocks, uncovered at spring tides.

Though my specimens differ in a few immaterial points from the descriptions in Montagu and Turton, there can be little doubt they belong to this species, first imperfectly figured by Laskey in the **Wernerian Transactions**. None of my specimens have the faint brown band mentioned by Turton. I have introduced the description of this little known species for the sake of companion with the following.

10. Turbo carneus.

T. testâ subconicâ umbilicatâ, striis elevatis regularibus subdistantibus cinctâ; spirâ brevi, apice elevato acuto.

Icon. Tab. nost. V. f. 12 & 13. Aucta, fig. 13, b.

Shell rather strong, semi-transparent, subglobular, flattened beneath, umbilicated. Body volution scarcely so much rounded beneath as in *T. margarita*, so that the shell has an obtusely carinated appearance. Volutions four, convex, with regular, elevated, rounded belts, separated by grooves, and continued almost to the apex; these are rendered rather rough by the faint transverse striæ of growth, but the shell has no trace of any epidermis. Spire short, elevated; the apex raised, pointed, subacute. Aperture and umbilicus exactly as in *T. margarita*. In my largest specimen, the outer lip is turned outwards at its attachment to the body volution, and forms a sinus; as if to afford a passage for some organ belonging to the animal. I regret extremely that particular circumstances prevented me from ascertaining the peculiarities (if any existed) of the animal, though the specimen was obtained alive. As it does not however occur in my other specimens, I cannot attribute it to any other cause than an accidental distortion.

The whole shell is of an uniform yellowish flesh-colour, darker towards the spire, lighter beneath and at the apex; without any of the metallic lustre which is so remarkable in *T. margarita*. Aperture silvery within. Operculum horny.

In its youngest state this shell can readily be distinguished from *T. margarita* by the characters I have laid down; though it is certainly so nearly allied to that species that it may easily be supposed to have been overlooked as a variety.

ART. XIII. *A List of the Species of Vespertilionidæ found in Great Britain.* By JOHN EDWARD GRAY, Esq. M.G.S.

MERRET in his *Pinax* led the way to the study of the animals of a peculiar country; and LINNÆUS in his *Fauna Suecica* following up the subject, shewed the manner in which it ought to be treated. But this kind of study, which since the time of the latter

great naturalist, has become so fashionable, is now fortunately on the decline, and is giving way to the study of natural groups, or the monography of particular genera; a mode of illustration which is much better adapted to the improvement of science. But yet as it is certainly both interesting and useful to the student, to be acquainted with what are the native inhabitants of his own country, especially when that country is such an insulated place as Great Britain; and as I consider that a list of the Species of a group from a systematic author, with a few of the principal Synonymy is as useful for that purpose as a more enlarged description; I have drawn up such a list of the Species of Bats found in this country, which are preserved in the British Museum, with an account of their habitation when they appeared local.

1. *Vespertilio murinus*. *Linn.—Desm. Mam.—Ency. Meth.* n. 200.
2. *Vespertilio Bechsteinsi*. *Leister.—Desm. Mam.* n. 201.
New Forest. *Mr. Millard.*
3. *Vespertilio Nattereri*. *Kuhl.—Desm. Mam.* n. 202.
Common about London.
4. *Vespertilio Noctula*. *Gmelin.—Desm. Mam.* n. 204.
Vespertilio laicopterus. *Schreb. Saught.* t. 58.
5. *Vespertilio mystacinus*. *Leister.—Desm. Mam.* n. 211.
Vespertilio Barbastellus. *Montague Mus.*
Devonshire. *Montagu.*
6. *Vespertilio serotinus*. *Gmelin.—Desm. Mam.* n. 205.
About London.
7. *Vespertilio pygmæus*. *Leach. Zool. Journ.* i. 559.
? *Vespertilio pipistrellus*. *Desm. Mam.* n. 209.
Dartmoor. *Dr. Leach.*
8. *Plecotus auritus*. *Geoff.*
Vespertilio auritus. *Linn.—Desm. Mam.* n. 223.
Common. London.
9. *Rhinolophus unihastatus*. *Geoff.—Desm. Mam.* n. 184.
Vespertilio ferrum Equinum. *Linn.*
10. *Rhinolophus bihastatus*. *Geoff.—Desm. Mam.* n. 185.
Vespertilio ferrum Equinum. *β. Gmelin.*

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Vespertilio Hipposideros. *Bechstein.*

Vespertilio minutus. *Montague.*—*Linn. Trans.* ix, 163.
Devonshire. *Montague.*

There are two other species described as British which are not in the British collection of the Museum.

Vespertilio emarginatus. *Geoff.*—*Desm. Mam.* n. 210; which was discovered by M. Alexander Brongniart at Dover, and which Dr. Fleming also states he has found in Fifeshire,

Colonel Montague, and Dr. Fleming, most probably from him, have included *Vespertilio Barbastellus.* *Linn. (Desm. Mam.* n. 224.) among the native Bats of Great Britain; but the specimen at present in the Museum, which was in Colonel Montague's collection under that name, is *V. mystacinus* of Leister, and is exceedingly different from *V. Barbastellus*, so that it is doubtful whether that species is a native of these islands. Dr. Kuhl in his Work on the Bats of Holland observes that it is rare in that country.

This list enumerates nearly twice as many species as have been hitherto considered as British: but most probably when more attention has been paid to the subject many more may be discovered, as there are six or seven distinct species, besides what are here enumerated, which are found in Holland, and other neighbouring parts of the continent.

ART. XIV. *Descriptions of some hitherto uncharacterized Brazilian Birds.* By GEORGE SUCH, M.D. F.L.S.

[To the Conductors of the Zoological Journal.]

GENTLEMEN,

BUSINESS of importance having occurred to call me away from this country at an earlier period than I had anticipated, when I addressed the former observations to you on Brazilian Ornithology to which you were so kind as to give a place in your Journal, I have been prevented from continuing those observations to as

great an extent as I had purposed. Before I take my departure, however, I beg leave to add to the descriptions which I have already submitted to you, those of a few more of the birds which were the fruit of my late researches in Brazil, and which appear to me to be as yet uncharacterized. I do not find any of them referred to in the popular works in Ornithology in this country. But as many Brazilian species have lately been described on the continent, in works which are not to be met with in any of the public libraries in this metropolis, and which from my short stay in England, and my abrupt departure, I have myself not had an opportunity of procuring from abroad, I cannot be certain that I may not have been anticipated by foreign naturalists in some of my descriptions. The birds, however, I must observe, come from a district, which had never, until lately, been explored by any collector of Natural History, and which at the same time, as I formerly mentioned, presents a character peculiarly distinguishing, and favourable both to the constant and occasional assemblage of numbers of the feathered tribes.* And there is therefore some reason to suppose that many of the birds belonging to it are new to science. As a corroboration of the justness of this inference I shall adduce the fact, that of a single genus, (*Thamnophilus*, Vieill.) I procured six uncharacterized species in the district to which I allude, which were entirely unknown to Mr. Swainson, whose ornithological researches in Brazil, as is well known, were carried to a considerable extent; while, on the other hand, of the numerous species of the same genus which were collected by that gentleman in various parts of the same empire, not one occurred to me in the course of my investigations.

I beg leave to add, that although at present debarred from continuing my observations in your Journal, I hope that I may not be altogether useless to science. The avocations which recall me to Brazil will afford me, I expect, an opportunity of again obtaining information in a field, on which I can scarcely say that I had more than entered during my former residence in South America. I now hope to recommence my labours in that quarter with more extensive information, and more ardent zeal. The knowledge,

* See Zoological Journal, Vol. I. p. 555.

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limited as it is, which I have had the good fortune to obtain during my short stay in England, will point out to me some of the chief points in Natural History to which I ought more particularly to direct my attention. While the comprehensive views which have lately been introduced into science in this country, so exalted above those which I had an opportunity of studying in my earlier acquaintance with Zoology, inspire me with additional ardour to extend my researches in a pursuit so truly intellectual and productive of delight.

I have the honour to be,

Gentlemen,

Your obedient Servant,

Berners Street,

GEORGE SUCH.

FEBRUARY 1st, 1825.

Ordo. INSESSORES. Vigors.

Fam. HALCYONIDÆ. Id.

Genus. GALBULA. Briss.

CEYCOIDES. *G. supra viridi-atra subtus alba, capite, gulæque nigro-brunneis ochraceo-lineatis, abdominis lateribus crissoque nigro-fuscis; pedibus tridactylis.*

Caput nigro-brunneum; frontis plumis ochraceis, verticis genarumque nigro-brunneis in medio ochraceo-lineatis, gulæ ochraceo brunneoque lineatis. Remiges virescenti-fuscæ subtus pallidiores, pogoniis internis ad basin albidis. Rectrices viridi-atræ, subtus fuscæ, ad apicem tæniâ rufâ perangustâ marginatæ. Rostrum, pedesque nigri. Longitudo corporis a fronte ad apicem caudæ, $5\frac{1}{2}$ poll.; alæ a carpo ad remigem $4^{\frac{1}{2}}$, $2\frac{3}{5}$; caudæ, $3\frac{1}{10}$; rostri ad frontem $1\frac{2}{3}$, ad rictum 2; tarsi, $\frac{4}{10}$; digiti medii, ungue incluso, $\frac{7}{10}$.

The *Jacamars* were originally placed by Linnæus among the *Kingsfishers*, to which in their general characters and habits

they bear a close affinity; differing from them chiefly in their food, which consists of insects, and in their mode of feeding, which is for the most part confined to spearing their prey by their sharp and pointed bills. M. Brisson, on the other hand, removed them from this their natural situation, on account of the *zygodactyle* structure of their feet, and associated them with the true *scansorial* birds, between *Picus* and *Bucco*. [Vol. IV. p. 85. Ord. XIII. Gen. 48.] In this arrangement he has been followed by succeeding Ornithologists until the present day. The bird before us however evinces the insufficiency of the character of the *zygodactyle* disposition of the toes as a general ground-work of division; as it intimately unites the genus *Galbula* with the three toed *Halcyonidæ* or the genus *Ceyx* of M. Lacepede. In fact the chief character of the group of *Jacamars*, as regards their legs, is not the disposition of the toes, but the extreme weakness of the members themselves. The strength of these is transferred to the wings, and indicates the station of the bird in nature to be among the groups which chiefly feed upon the wing. I am happy to have had an opportunity of exhibiting this bird to my friend Mr. Vigors, and confirming the justness of his views as to the propriety of restoring the *Jacamars* to their original situation among the *Halcyonidæ*, in which family he has included them in his Paper on the "Affinities of Birds" lately read before the Linnean Society, and now printed in the forthcoming Number of the Transactions. There are, it is true, tridactyle birds among the genuine *Pici*; but these possess a strength in their toes, and particularly in the solitary hind one, which furnishes them with the powers of climbing, and which is totally denied to the air-feeding bird before us. It is pleasing to observe how much more in unison with nature are the views of Linnæus, who founded his leading groups on their natural affinities, and then drew his characters from them, than those of his successors who first formed their artificial systems on minute and inconsequential characters, without regard to natural affinities, and then accommodated their groups to these characters.

Fam. LANIADÆ. Vigors.

Genus. GUBERNETES. Mihi.

Generis Characteres.

Rostrum crassum, subdepressum, basi sublatum, culmine rotundato; mandibulâ superiore apice leviter emarginatâ; naribus rotundis; rictûs vibrissis confertis, rigidis.

Alæ mediocres; remigibus 1^{ma} ad 5^{am} ferè æqualibus, primâ brevissimâ, secundâ longissimâ, pogoniis externis, primæ pogonio excepto, in medio emarginatis, internis integris.

Pedes; tarsis mediocribus; acrotarsiis paratarsiisque scutellatis; plantis reticulatis, squamis ovalibus.

Cauda longissima, forficata.

CUNNINGHAMI. *G. cineraceus, longitudinaliter fusco-lineatus, gulâ crissoque albis, fasciâ lunulari pectorali purpurascenti-brunneâ, alis caudâque-brunnescenti-nigris; remigibus longitudinaliter ferrugineo-fasciatis.*

Tab. iv.

Capitis, dorsi, abdominisque plumarum rhaches fuscæ. Tectrices inferiores albæ. Remiges brunnescenti-nigræ primæ pogonio externo albo, 3^{ta} ad 7^{am} pogoniis externis in medio ferrugineis, internis ad basin albidis. *Rectricium* rhaches supernè nigri subtus albi, primæ pogonio externo ad basin albo. *Rostrum* brunneum. *Pedes* nigri. Longitudo corporis, rostro caudâque inclusis, 15 $\frac{2}{3}$; *alæ* a carpo ad remigem 2^dam, $\frac{9}{10}$; *rectricis* 1^{ma} 10 $\frac{1}{4}$, 2^{da} 7 $\frac{1}{2}$, 3^{ta} 4 $\frac{9}{10}$, 4^{ta} 3 $\frac{3}{4}$, 5^{ta} 3 $\frac{1}{4}$, 6^{ta} 2 $\frac{9}{10}$; *rostri* ad frontem $\frac{4}{5}$, ad rictum, 1 $\frac{3}{10}$; *tarsi*, 1 $\frac{1}{10}$.

This bird appears to have a considerable affinity to the genus *Psaris* of M. Cuvier in the structure of its bill and wings, but it differs from it by other such essential characters as to have induced me to place it in a separate genus. Besides the difference in the structure of the tail, an important character in the present group of birds, which still retain some of the powers of flight belonging to the *Fissirostres*, the following differences may be noticed between the two forms. The rictal bristles of my bird

are strong and numerous, while in *Psaris* they are scarcely perceptible. The *tarsi* though somewhat longer than those of *Psaris* are in a slight degree weaker, while the toes are longer and stronger. The lateral scales of the *tarsi* are square and far asunder, while in *Psaris* they are rounded and numerous. The hinder scales also are less rounded, less close, and less conspicuous than in the latter genus.

I have named this species in honour of my friend, Colonel Cunningham, of Rio Janeiro; happy in having it in my power to make some slight return for the numerous and liberal attentions I have received from him, and to offer this public acknowledgement of the value in which I hold his friendship.

Fam. CERTHIADÆ. Vigors.

Genus. DENDROCOLAPTES. Ill.

CRASSIROSTRIS. *D. fusco-rufus, subtus pallidior fusco-fasciatus; capite nigrescente, collo pectoreque albo-lineatis; gulâ albâ; remigibus uropygio rectricibusque rufis; rostro nigro, crasso, longo, paululum incurvato.*

Capitis plumæ nigrescentes in medio albo-lineatæ, regione parotica albidâ, maculâ sub rictu nigrâ albo-notatâ. *Remiges* rufæ apice fusco, subtus pallidiores. *Tectrices* inferiores albidæ fusco-fasciatæ. *Abdominis* latera fusco-rufa. *Rostrum* pedesque nigri. *Longitudo corporis* a fronte ad caudam, 10; *alæ* a carpo ad remigem $4\frac{1}{8}$; *caudæ*, $5\frac{1}{2}$; *rostri* ad frontem, $1\frac{2}{8}$, ad rictum, $2\frac{1}{8}$; *tarsi*, $1\frac{1}{2}$; *digiti* medii, ungue incluso, $1\frac{1}{2}$, interni, $\frac{1}{2}$; *hallucis*, $\frac{1}{2}$.

FORTIROSTRIS. *D. fusco-rufus, subtus pallidior fusco-fasciatus; capite, dorso, ptilisque albo-lineatis; gulâ albidâ fusco-variegatâ; remigibus, uropygio, rectricibusque rufis; rostro nigro, forti, sublongo, paululum incurvato.*

Capitis plumæ nigrescentes in medio albo-lineatæ, striâ superciliari angustâ albâ, regione parotica nigrâ albo-lineatâ. *Gula* albida prope pectus maculis fuscis parcè notata. *Remiges* rufæ,

apice fuscæ. *Tectrices* inferiores albido-rufæ fusco-fasciatæ. *Abdominis* latera parçé albido-lineata. *Rostrum* nigrum, *pedes* graciliores subpallidi. *Longitudo corporis*, $8 \frac{7}{10}$; *ala* a carpo ad remigem 4^{am} , $4 \frac{17}{20}$; *caulæ*, $5 \frac{7}{10}$; *rostri* ad frontem, $1 \frac{1}{4}$; ad rictum, $1 \frac{7}{10}$; *tarsi*, $1 \frac{1}{10}$; *digiti* medii, $\frac{13}{20}$; interni, $\frac{11}{20}$; *hallucis*, $\frac{4}{3}$.

I find no description of either of the foregoing species in M. Lichtenstein's Monograph* on the genus *Dendrocolaptes*. The first of my species seems to come nearest the description of *D. longirostris*, Ill., but the white mandibles of that bird (*rostro compresso albo*; p. 200,) seem at once to distinguish it from my bird in which the bill is black; the colour of the bill, as well as its form, being considered as affording a strong specific character in this genus. My *D. crassirostris* bears some resemblance also to *D. scandens*, or the *Gracula scandens*, Lath., the *Picucule de Cayenne* of the "Planches Enluminés"† But the transverse dusky stripes on the back at once distinguish the latter bird from mine. The birds of this genus exhibit a great similarity of colouring among themselves, so much so as to render it difficult to distinguish the species, unless by the structure of the bill. This is so far the case in the two species above described, as to have induced me to suppose when I first met with them, that they were varieties of one species. But the shorter bill and more slender legs and feet of *D. fortirostris* point out a sufficient ground of distinction, as well as some minute characters in the colouring of the two species, which are particularized in the foregoing description of them. These differences I found to be constant between the two species, having had an opportunity of examining a number of specimens of each, among the birds collected by me in the sequestered part of Brazil, which I have already mentioned as the scene of my zoological researches, and where they were by no means uncommon.

* Berlin Transactions for 1818—1819. p. 197.

† Pl. 621.

Ord. GRALLATORES. Ill.

Fam. ARDEIDÆ. Leach.

Gen. ARDEA. Linn.

FASCIATA. *A. brunnescenti-nigra, ferrugineo-fasciata, capitis vertice, caudâ, remigibusque nigris, his apice albis, gulâ lineâque pectorali albis, hac ferrugineo-variegatâ, abdomine rufo.*

Alula, pteromataque nigro-fuscæ, apice fasciâ angustâ albâ marginatæ. Tectrices inferiores albæ, fusco-variegatæ. Rectrices supra nigræ, subtus fuscæ, duabus mediis apice albo-maculatis, cæteris apice fasciâ perangustâ albâ marginatis. Abdominis latera, uropygium, crissumque cineraceo-fusca, hoc albo-variegato. Rostrum nigrum. Pedes subflavescentes. Longitudo corporis, 2 Pedes, 4 $\frac{1}{2}$ Unc.; rostri ad frontem, 3 $\frac{2}{3}$; ad rictum, 4 $\frac{1}{2}$; alæ a carpo ad remigem 3^{uam}, 12 $\frac{1}{2}$; caudæ, 5; tarsi, 3 $\frac{1}{2}$; digiti medii, 2 $\frac{1}{2}$.

From the confusion which has hitherto existed in the extensive Linnean group of *Ardea* in consequence of the great variation that takes place in the birds of that genus during their different stages of growth, I cannot speak with confidence as to this bird being a distinct species from some of those already described. It comes in among the group which is familiarly known by the denomination of *Tiger Bitterns*, all of which are assimilated by the markings of their plumage, which bear a general resemblance to the spots and *striae* of the animal whence they derive their trivial name: and it may possibly prove to be but a variety of a known species in a group where all are so much alike. I find however no description or representation which exactly corresponds with it; the black head in particular and rufous *abdomen* offering very distinguishing characters. I consider myself therefore justified in keeping it apart, and designating it as a distinct species, at least until the whole group is more accurately defined. I hope to make some decisive observations on these *Tiger Bitterns* during my ensuing researches in Brazil, which seems to be the chief *habitat* of these birds. Hitherto I have seen but one specimen of the bird before us.

ART. XV. *Analytical Notices of Books.**Annales du Muséum d'Histoire Naturelle. 1824. Parts 4 and 5.*

Of the Zoological contents of these parts the most important is the "Description of a new genus of carnivorous Mammalia," by M. Isidore Geoffroy St. Hilaire. MM. F. Cuvier, Desmarest, and Geoffroy St. Hilaire, had already given the principal characters of this very interesting animal, which was brought from the Cape of Good Hope by the unfortunate Delalande; and G. Cuvier had assigned to it provisionally the name of *Civette*, or *Genette*, *hynoïde*, thus pointing out its close affinity with the Civets and the Hyænas. The external resemblance which it bears to the latter group, and particularly to the Hyæna of the East, is eminently striking; it possesses the same ground of colouring, and the same system of transverse rays; it exhibits also a similar mane, and an equally evident shortness of the hinder members. But it deviates from them in the characters of its physiognomy, which bring it nearer to the former group, and even to the animals of the genus *Canis*. Instead of the obtuse and apparently truncated snout terminating the broad and compact head of the Hyæna, this animal possesses a rather slender and elongated one, terminating a head of elegant proportions, approaching more nearly to that of the Foxes; a difference which is principally produced by the zygomatic arch being less distant from the cranium. From this organization it results that the mass of the muscles of the lower jaw is less than in the Hyæna, and that the cerebral cavity and consequently the brain is increased; a fundamental distinction, which produces the necessity of forming a new genus to receive it, and to which M. Isidore St. Hilaire has given the name of *Proteles*, changing the trivial name of M. Cuvier into *Lalandii*. The new generic appellation is intended to point out a very striking peculiarity of this animal, implying, on a principle previously adopted by Geoffroy St. Hilaire, its perfectness with respect to the number of toes of the anterior feet, which are five, in opposition to those

of the Hyæna, which are only tetradactyles ; a character though not of primary importance, yet very easy to seize, and strongly distinctive. No dentary characters can yet be assigned, as the only three individuals hitherto discovered are so young as not to have acquired their permanent teeth.

In the detailed examination of the Osteology of the *Proteles Lalandii*, M. Isidore St. Hilaire points out its very striking resemblance in many particulars to that of the Hyæna. With this it perfectly agrees in its vertebral column, in the pelvis, the whole posterior extremity, the scapula, the bones of the leg and of the carpus, and in the four external toes. It differs however in possessing a slender additional toe, but the rudiments of this are also to be found in the Hyæna ; in the number of ribs, which is intermediate between the Civets and the Hyænas ; and especially, as has been already noticed, in the cranium.

The nocturnal habits of the *Proteles* add still more strongly to the striking similarity which it bears to the Hyæna. Like this latter animal it also possesses a great facility in digging ; but while this faculty is employed by the Hyæna to disinter carcasses, it is chiefly made use of by the *Proteles* to form burrows similar to those of the Fox. In one of these, at the extremity of Caffraria, the three individuals killed by Delalande lived together : their rarity appears to be extreme, since it is even said that they were unknown to the natives.

The "Description of the *Polyprión Cernium*," by M. Valenciennes, recalls the attention to the very curious fact that several species of fishes inhabit equally the Mediterranean and the Seas of the Cape of Good Hope. The *P. Cernium* however has not only been found in both these localities, but also in the seas of America, and has therefore been described by Schneider as the *Amphiprion Americus*. It is also the *A. australe* of the same author, the *Scorpena Massiliensis* of Risso, and probably the *S. Americana* of Gmelin. The possession of several individuals, as well from the Cape as from the neighbourhood of Nice, has enabled M. Valenciennes to determine their specific identity, and to furnish a description of the species in its various stages of

growth, together with some account of its anatomy. Its specific character is as follows,

P. Cernium. P. corpore griseo toto squamoso; capite magno subcomplanato, sulcis radiantibus exarato; maxillâ inferiore longiore.

Br. 7 D. $\frac{11}{12}$ P. 18. V. $\frac{1}{2}$. A. $\frac{3}{16}$. C. 17.

A "Notice on an Hymenopterous Insect of the family of the *Diplopteris*, known in certain parts of Brazil and of Paraguay under the name of *Lecheguana*, and collecting honey," by M. Latreille, refers to a very interesting fact, and one which might, but for the repeated confirmation of it by succeeding travellers, have been regarded as doubtful. The insect is referable to M. Latreille's first section of the genus *Polistes*; and he assigns to it the trivial name of *Lecheguana*. Its characters are "body black, rather silky, and punctured; scutellum prominent; head, thorax, and feet without spots; metathorax unidentate on each side; hinder margin of the five first segments of the abdomen yellow; under wings clouded at their base." Only neuters have yet been seen of this interesting insect, which presents an exception to the rule hitherto generally received, that Bees alone were possessed of the means of making honey. The honey of the *Lecheguana* has been examined by M. Lassaigue, who has ascertained that it differs considerably from that of the bee; the former being entirely soluble in alcohol, while the latter treated with the same solvent, leaves a saccharine, solid, and cristallizable mass.

The article by M. Geoffroy St. Hilaire, "On the nature, formation, and uses of the Stones found in the auditory cells of Fish," is adapted to destroy the theory advanced by Camper, that these parts constituted an essential portion of the organ of hearing. The attention of the sagacious author of this paper was first directed to the subject by the consideration that if these were really bones, they would offer a very decided deviation from all the analogies which he had previously observed; and the result of his enquiries has been to establish the fact that they are merely to be regarded as calculi formed in a cavity which has no communication with the external air. The most important objection that can be urged against this explanation appears to be derived

from the determinate forms which they retain in the respective species; but this is readily to be accounted for as depending on the shape of the cavities in which they are deposited, and the markings on their surfaces as imprinted by the nervous filaments surrounding them. We cannot but regret that we are restricted from entering into the very curious and satisfactory details that are given in illustration of this article; the same cause will also confine our notice of the only remaining one, "On a singular alteration of certain human heads," by G. Cuvier. The subject of this latter is however rather geological than zoological, referring to certain monstrously enlarged crania, which have been repeatedly adduced as proving the existence of a distinct antediluvian race of men. In reply to this assumption M. Cuvier distinctly establishes, that one of the crania in question is recent; that the whole which he has seen belong to children who had not yet obtained their permanent teeth; and that they are the result of a disease which, fortunately for humanity, is exceedingly rare.

Simiarum et Vespertilionum Brasiliensium Species Novæ; ou Histoire Naturelle des Singes &c. Publiée par Jean de Spix. Munich, 1823. Atlas folio. pp. viii and 72. tab. xxxviii.

A more striking illustration of the limited extent of our acquaintance with the treasures of nature can scarcely be adduced, than that which is exhibited by the present splendid and valuable publication. That two travelling naturalists, wandering through the interior of a single country, during the space of little more than three years, should collect upwards of thirty animals, entirely new to science, in a group of primary importance, would appear extraordinary; but it becomes still more so when we reflect that this new acquisition is nearly equal in number to the one half of those which were previously known. What may be the extent of the collection in the other families of Mammalia, it is at present impossible to ascertain, but if this noble commencement is to be assumed as a specimen of the whole, it must indeed be immense, and almost unlimited in richness and extent; and natural history will have to enumerate among its most important acquisitions the

results of the travels of M. Spix and Dr. Martius. The magnificent style in which the present portion is executed, is fully equal to the important nature of the undertaking, though too expensive for private libraries in general. Considered however as a national work, in which light it is probably regarded by the King of Bavaria under whose auspices it is published, this luxury of execution is less to be regretted, and may in fact rather be viewed as a tribute of respect to the science which it is designed to promote.

The Monkeys of America are readily distinguished from those of the old continent by several very prominent characters. In the former the dissepiment of the nostrils is thicker, and these openings are directed laterally, while in the latter the dissepiment is thin, and the nostrils are oblong and situated in front; the former are also entirely destitute of the cheek-pouches so frequently met with in the Asiatic and African species, and none of them possess callous nates, the only approach to this conformation being in the greater or less baldness of these parts in *Brachyteles*, *Ateles*, and *Mycetes*. The number of the molar teeth affords another strong distinguishing character, being limited in the monkeys of the old world to five at the utmost, while the whole of the American ones, excepting *Jacchus* and *Midas*, have six on each side. Each of these grand divisions of the globe possesses also in addition to these leading distinctions between the groups, some forms peculiar to itself, and to which there have not hitherto been discovered analogous ones in the other. In America no species has been found entirely without a tail, similar to the Orang of the old continent; nor does the latter exhibit one possessing only four fingers and no thumb, as the *Ateles* of Brazil, or any furnished with the vesicular larynx of *Mycetes*, which fills the woods of America with its bellowing. The Monkeys of America appear in fact to belong to a higher race; they are less ferocious, and more easily tamed, are less voracious, and especially less carnivorous, more frequently employ their members as hands than as feet, and possess a cranium more developed in its cerebral capacity, and with more approximate orbits. In these latter particulars they are only exceeded by the Orang, next to which they would

seem naturally to rank, and to be succeeded by the other Monkeys of the old continent, by the Baboons, &c.

In describing these very interesting animals, M. Spix has found it necessary to introduce several new genera, the affinities of which will be best understood by the following table, in which we have referred the several new species to their proper positions.

TRICHIURI

Caudâ apice subtus pilosâ.

Caudâ volubili, apice intortâ.

1. *Cebus*. *C. macrocephalus*, libidinosus, xanthocephalus, unicolor, gracilis, cucullatus.

Caudâ non volubili

abbreviatâ.

2. *Brachyurus*. *B. Israelita*, Ouakary.
villosâ.

3. *Pithecia*. *P. hirsuta*, inusta, capillamentosa.
comosâ, subtenui. Diurna.

4. *Callithrix*. *C. personata*, cinerascens, nigrifrons,
Gigot, cuprea.

taxâ, subtenui. Nocturna.

5. *Nyctipithecus*. *N. felinus*, vulpinus.
gracili, elongatâ, non annulatâ.

6. *Midas*. *M. fuscicollis*, nigricollis, mystax, bicolor.
gracili, elongatâ annulatâ.

7. *Jacchus*. *J. pygmæus*, albicollis, penicillatus.

GYMNURI.

Caudâ apice subtus calvâ prehensili.

Tetradactylus, longimanus, larynge subtuberoso.

8. *Ateles*.

Subpentadactylus, longimanus, larynge non tuberoso.

9. *Brachyteles*. *B. macrotarsus*.

Pentadactylus, sublongimanus, larynge non tuberoso.

10. *Gastrimargus*. *G. olivaceus*, infumatus.

Pentadactylus, stentor, larynge maxime tuberoso.

11. *Mycetes*. *M. fuscus*, stramineus, barbatus, discolor.

The names of the second, fifth, ninth and tenth of these genera are new to science; it is however necessary to offer a few remarks as to the novelty of the groups to which they are applied. The first of them, *Brachyurus*, appears to be perfectly new, and deserving of the distinction applied to it: the second, *Nyctipithecus*, is given to a nocturnal group, to one of which most probably, Humboldt, and subsequently Geoffroy, had given the generic name of *Aotus*; but as the whole of M. Spix's species possess visible ears, this latter name becomes inapplicable, and the characters also require alteration: the third, *Brachyteles*, is formed to receive the *Ateles hypoxanthus* of the Prince de Neuwied, (the *Lagothrix Humboldtii*, Geoffroy), a necessary correction, as the animal possesses a short thumb: and the last is probably synonymous with the *Lagothrix* of Geoffroy, except that it is more restricted in its characters. The *Stentor* of the latter author is also in the preceding list exchanged for the earlier name of *Mycetes*.

Of the whole of the species enumerated above, as well as of three others not previously figured, very detailed descriptions are given in Latin, with observations in French on their respective habits, and on their affinities. Each of them is also figured on a separate plate, and coloured from nature.

To distinguish the Bats of Brasil, which constitute the second portion of the work, from those of the old continent, is more difficult, since unlike the Monkeys, they do not form a separate family at once recognisable by strong and peculiar characters. Many of the genera of Bats are in fact common to both continents, and the only character pointed out by Geoffroy as distinctive in one Brazilian genus, *Phyllostoma*, that it possessed an additional or fourth phalanx to the middle finger, is controverted by M. Spix; who states that the same may be found, although very small, not only in all the other fingers in that genus, but also in all other bats. The Brazilian bats are more frequently furnished with membranaceous crests upon the nose than those of the old continent, but as the whole of them do not possess this character, and as one African and one European genus, *Megaderma*

and *Rhinolophus*, are equally provided with it, it cannot be regarded as affording any really distinguishing mark.

The following is the arrangement of the genera given by M. Spix, in which we have enumerated as before the species now first described.

ANISTIOPHORI.

Naso non perfoliato

porrecto; labio superiore leporino; caudâ vix exsertâ, membranâ interfemorali pedibusque perbrevis:

1. *Noctilio*. *N. rufus*, albiventer.

Subporrecto-obtusio; auriculis obtusis, supra, fere confluentibus; caudâ longissimâ membranâ interfemoralem exsuperante:

2. *Molossus*. *M. ursinus*, nasutus, fumarius.

pollice manus infra patellâ armato:

3. *Thyroptera*. *T. tricolor*.

prolongato, acuminato:

4. *Proboscidea*. *P. saxatilis*, rivalis.

subporrecto, subacuto; caudâ longissimâ membranâ interfemoralem non nihil exsuperante; dentibus incisivis inferioribus 6, superioribus 4, lobatis:

5. *Vespertilio*. *V. Brasiliensis*.

ISTIOPHORI

Naso perfoliato

unifoliato

ore verrucoso, obtuso; labio superiore et inferiore integro; caudâ nullâ:

6. *Vampyrus*. *V. cirrhosus*, bidens.

ore verrucoso, obtuso; labio superiore et inferiore integro; cauda brevi:

7. *Phyllostoma*. *P. planirostre*.

ore non verrucoso; labio inferiore subfisso; linguâ elongatâ, setis hispidâ:

8. *Glossophaga*.

bifoliato; caudâ et membranâ interfemorali nullis:

9. *Diphylla*. *D. ecaudata*.

Of these genera the third, fourth, sixth, and ninth are new; the latter being particularly worthy of attention from the total

absence of tail, as well as of interfemoral membrane. The whole of the species in this department also are figured, with the exception of the *Proboscidea rivalis*, differing from the *P. saratilis* only in size and colour; and descriptions and figures are given of two other species, which although not new, appeared to require elucidation; the *Noctilio soricinus*, which is neither ecaudate nor referable to the genus *Glossophaga*, as stated by Geoffroy, and the *Glossophaga amplexicaudata*, inaccurately represented in the work of that great and philosophic naturalist. The *Vespertilio Brasiliensis* of M. Spix does not correspond with the species described under the same name by M. Desmarest; neither is it the *V. Hilarii* of M. Isidore Geoffroy St. Hilaire.

The two concluding plates are filled with Crania, illustrative of the relative proportions borne by those of the several genera of Monkeys to each other, and to that of a native Indian.

Philosophical Transactions for the Year 1824. Part 2.

THE present part contains only three Papers which properly come under our consideration. Two of these are from the pen of Sir Everard Home, and relate to several interesting points of comparative Anatomy, and the third consists of a Communication from Mr. Dillwyn in continuation of his Observations on Fossil Shells, noticed at p. 120 of our former volume.

The "curious facts" in the Anatomy of the Walrus and the Seal, pointed out by the first of these gentlemen, were derived from the examination of specimens brought to this country by the late Arctic Expeditions: the following are briefly the results: 1st, That the hinder flipper or foot of the Walrus possesses a structure perfectly analogous to, or rather identical with, that of the apparatus by means of which the Fly supports itself in a perpendicular or dependent position. 2nd, That the duodenum of this Animal does not receive the bile through a common duct, formed by the union of those of the Liver and Gall Bladder; but that this latter organ, which lies behind the duodenum in the form of a large cylindrical hard body, receives the bile laterally

by a single duct from the Liver, and pours it immediately into the intestine by means of an opening projecting in the manner of an *os tincæ*. This structure differs entirely from any that has hitherto been observed, and it is worthy of remark that the food, with which the Stomach of this animal has been found filled, consisted wholly of the *Fucus digitatus*, which Sir E. Home appears to consider peculiar to it. 3rd, That in the placenta of the Seal, the trunks of the vessels of which the funis is composed, are not twisted upon each other, and that at about a third part of their length from the placenta they subdivide into branches, which freely anastomose together, and are connected to the placenta itself by membranous folds, between which the blood vessels are conveyed to its substance, on which they ramify with great minuteness; a structure that will obviously give greater facility to the circulation, and renders it an object of interest to ascertain whether the same peculiarities are to be found in other marine animals.

The other paper by Sir Everard Home, presents "An Account of the Organs of Generation of the Mexican Proteus, called by the natives Axolotl." He considers that Cuvier has positively established the fact that the Proteus of Germany, as well as that of Carolina, are actually animals in a perfect state, and not larvæ. The discovery that the vertebræ of the Mexican Proteus were cupped in the same manner as those of the two other species, had already convinced him that it also belonged to the same tribe, and was consequently an animal in a perfect state. To place this question, however, beyond all doubt, he obtained from Mr. Bullock several specimens, brought from a Lake three miles from the City of Mexico, where they are so abundant in the month of June, as to form a principal part of the food of the peasantry. Two of these specimens, the male and female, are here represented, together with dissections of their viscera, which bear a close resemblance to those of the Aquatic Salamanders. The female organs in their developed state are beautifully shewn, and there is every probability, from the appearance of the ova contained within them, that they pass out singly.

The leading features of Mr. Dillwyn's Observations on the Fossil Shells of the different strata, tend more especially to establish the hypothesis, "that the Shells of *unknown families* are confined to the beds *below the lower oolite*. In all the upper formations a relationship is completed between fossil and recent shells, in the following regularly approximating series. In the *secondary strata above the lias* as to *Natural Orders*, in the *London Clay* as to *genera*, and partially as to *species* in the *Crag*, in which alone any fossil can be completely identified with a living species."

British Entomology; or Illustrations and Descriptions of the Genera of Insects, &c. By JOHN CURTIS, F.L.S., Nos. xiii.—xvi.

THE first of these numbers contains 1. *Platypus cylindrus*, a Bostricoid insect, which has occurred only once in this country, but at that time in the greatest profusion; discovered by Mr. Bydder in the New Forest: 2. *Onthophagus Taurus*, from the same locality; a very common continental species, but of which the specimen figured, taken in October last, is the only one hitherto discovered in Britain: 3. *Ægeria ichneumoniformis*, a very rare species, the *Sphinx vespiformis* of Haworth's Lepidoptera Britannica: and 4. *Lophyrus Pini*.

The fourteenth number comprises 1. *Melasis buprestoides*: 2. *Eulepia Cribrum*, a new genus formed to include this species, which is new to Britain, and the *Bombyx grammicus*, and distinguished chiefly from the Arctiadae by its oblong, incumbent, and convolute wings, the inferior ones being much folded: 3. *Leptocerus ochraceus*; a new species of a Phryganeous genus established by Dr. Leach: 4. *Cryptus pallipes*, Leach, Zool. Misc.

In the fifteenth number we have figures of 1. *Cossonus Tardii*, a new species of considerable size discovered by the gentleman after whom it is named, under the bark of decayed hollies in the County of Wicklow: 2. *Cossus Ligniperda*, a very beautiful variety of the female: 3. *Anthidium manicatum*, Lin. and Kirby Mon. Ap. Ang. **c. 2. β.: 4. *Dolichopeza sylvicola*, a new

species of a new Tipulidous genus, differing from *Tipula* in having only twelve joints in the antennæ and a few scattered bristles upon them, instead of thirteen joints ornamented with whorls of hair; from *Linnobia* in the very great length of the terminal joint of the palpi and the long cylindric joints of the antennæ; and from both in the absence of the third discoidal cell, and in the extraordinary length of the basal joints of the tarsi, which are all very much longer than the tibiæ.

The sixteenth number contains 1. *Acilius cinereus*, now first noticed as British, and distinguished from the common *A. sulcatus*, by being smaller and darker, with the hinder thighs entirely pale and not black at their base: 2. *Eupithecia linariata*, the beautiful pug of the collectors, a new genus comprising the species of Mr. Haworth's section, *Abbreviata*: 3. *Hylotoma Stephensii*, Leach: and 4. *Helcomyza ustulata*, Meigen, MSS., a genus nearly allied to *Scatophaga*, from which it may however be at once distinguished by the tibiæ being only woolly without any bristles, and by the basal joint of the posterior tarsus not being longer than the second, rather compressed, and a little bent.

The Genera of Recent and Fossil Shells. By G. B. SOWERBY, F.L.S. with original Plates, by J. D C. SOWERBY, F.L.S. No. XXV.

THE Genera illustrated in this number are five; *Sanguinolaria*, *Coronula*, *Saxicava*, *Buccinum*, and *Nassa*. The former of these does not correspond precisely with the genus as established by Lamarck, the *S. occidentens* and *rugosa* of that great Conchologist, being regarded as referable rather to *Psammobia*, while his *Solenes*, *violaceus* and *rostratus*, are included in the present *Sanguinolaria*, of which *S. rosea* may be taken as the type. The species figured are *S. rosea* and *S. Diphos*, the latter being the *Solen Diphos* of Chemnitz, and *Solen rostratus* of Lamarck. The genus *Saxicava* is particularly deserving of attention from the extremely variable appearance of its typical species, which is at once the *Solen minutus* of Chemnitz and Montagu, *Hiatella arctica* of Daudin,

Cardita arctica of Bruguiere, *Byssomya* of Cuvier, *Saxicava rugosa* of Lamarck and Turton, and *Pholeobius* of Leach; the same shell having thus in its different stages of growth, and in its numerous irregularities of form, been referred to no less than six genera. *Buccinum*, adopting as its type the common *B. undatum*, is confined to those species in which the canal is straight; it is consequently much more limited than the corresponding genus of Lamarck. The fossil species are few in number, and it is remarked by Mr. Sowerby, that the *B. stromboides* approaches very nearly to the *Cymbia*, being distinguished chiefly from that subgenus of Volutidæ by the absence of folds on the columella. But while the genus *Buccinum* is thus restricted, *Nassa* becomes proportionally extended, as it is made to include not only those species which possess a thickened and callous inner lip, but also those in which the short canal is reflected. In this point of view it exhibits a very striking affinity with *Cassis*, one of the species figured, the *N. globosa*, being scarcely distinguishable from that genus. It also includes the *Buccinum reticulatum*, *B. Macula*, and several other species common on the British Coasts.

ART. XVI. *Proceedings of Learned Societies on subjects connected with Zoology.*

ROYAL SOCIETY.

January 27, 1825. The reading was commenced of a paper *On the Anatomy of the Mole-Cricket*; by John Kidd, M.D. F.R.S.

February 3.—The reading of Dr. Kidd's paper was concluded; and an *Appendix to the Croonian Lecture*, by Sir E. Home, Bart. V.P.R.S. read, announcing the simultaneous discovery by himself and Mr. Bauer, of nerves in the human navel-string and placenta; drawings of which by Mr. B. were annexed to the paper.

February 10.—A paper was read of which the following is a brief abstract:—

Notice of the Iguanodon, a Fossil Herbivorous Reptile, found in the sandstone of Tilgate Forest; by Gideon Mantell, F.L.S., communicated by Davies Gilbert, Esq. V.P.R.S.

In the sandstone of Tilgate Forest, near Cuckfield, in Sussex, which belongs to the iron-sand formation, and forms part of a chain of hills extending from Hastings to Horsham, are found the teeth and a few of the bones of the subject of this paper, together with those of a gigantic species of crocodile, of the *megalosaurus* and the *plesiosaurus*, and the remains of turtles, birds, and vegetables. The author, some time since, sent specimens of the teeth to various naturalists; in particular to M. le Baron Cuvier, whose opinion of them coincided with his own, that they belonged to an extinct herbivorous reptile hitherto undescribed. With the assistance of Mr. Clift, he had subsequently compared them with those of a skeleton of the recent *Iguana* of the West Indies, in the museum of the Royal College of Surgeons, with which he found them to possess a close affinity, and he details, in this notice, the particular results of the comparison; adverting, also, to the probable station of the extinct animal in the order of Saurians. From the affinity just mentioned, and at the suggestion of the Rev. W. D. Conybeare, he had given it the name of *Iguanodon*. On the supposition that the proportions of the parts in the extinct animal were the same as in the recent, Mr. Mantell infers that the *Iguanodon* must have exceeded in size even the *megalosaurus*, and have been upwards of sixty feet in length. From the fossils associated with its remains, he concludes, that if an amphibious, it was not a marine reptile, but inhabited rivers and freshwater lakes. Drawings of the teeth and bones of the *Iguanodon* were annexed to this communication.

February 24.—The reading was commenced of a paper *On the Maternal-Fœtal Circulation*; by David Williams, M.D., communicated by Dr. Thomas Thomson, F.R.S.

March 3.—The reading of Dr. Williams's paper was resumed and concluded. This essay gave an account of the different speculations entertained on the nature of the medium circulating between the uterine and umbilical vessels, and considered the evidence brought forward in their support to be unsatisfactory. It then stated, that it had occurred to the author that it might be practicable to arrive at more satisfactory proofs in favour of one or the other of these speculations, by observing the phenomena which would present themselves in the fœtal vessels on injecting

oil into the maternal vessels, while their irritability was yet active. Experiments were consequently instituted. From their result Dr. W. is disposed to conclude that the maternal and foetal systems in the canine species, are parts only of a common uninterrupted sanguiferous system. From analogy, Dr. W. also infers the communication between parent and foetus to be similar in all viviparous animals; and remarks that if his conclusion and inference can be admitted, we shall have reason to doubt the validity of the doctrine of the maternal-foetal circulation as taught by Dr. Harvey, together with its modern superstructure. For that if his, Dr. W's, experiments and deductions be correct, we can no longer subscribe to the hypothesis of there being two independent sanguiferous circulations in the impregnated state, nor to that of the placenta being an organ of respiration or aëration.

Dr. J. R. Johnson, F.R.S. communicated *Some further observations on the genus Planaria*; in which he stated that Mr. Dalyell of Edinburgh, in a work on the *Planaria*, having asserted that an individual of *P. cornuta* accidentally wounded near the head, produced a new head from the incision, he conceived that the verification of so curious a fact would be interesting to the Royal Society; and accordingly took one hundred of the animals, and made an incision in the side of each; but one of them however produced the new head: in the greater number the wound healed, and in some, preternatural excrescences only were produced. Dr. J. proceeded to detail some further remarks on the reproductive faculties of the *Planaria*, and to describe *P. nigra*, of which a drawing was annexed. It has the abdominal proboscis like the others.

March 10.—J. H. Green, Esq. Professor of Comparative Anatomy to the Royal College of Surgeons of London, was admitted a Fellow of the Society.

March 17.—The name of Dr. J. Richardson was ordered to be inserted in the printed lists of the Royal Society; and the Society for promoting Animal Chemistry communicated a paper by Sir E. Home, V.P.R.S. entitled *Observations on the Influence of the Nerves and Ganglions in producing Animal Heat*.

March 24.—Major C. Hamilton Smith, A.L.S. was admitted a Fellow of the Society.

In consequence of the approaching fast and festival, the Society then adjourned over two Thursdays to meet again on April 14.

April 14, 21, & 28.—These three meetings were occupied by the reading of *A Monograph on Egyptian Mummies, with Observations on the Art of Embalming among the Ancient Egyptians*; by A. B. Granville, M.D. F.R.S.

LINNEAN SOCIETY.

January 18, 1825.—A portion of the Rev. Messrs. Sheppard's and Whitear's Catalogue of the Birds of Norfolk and Suffolk was read.

February 1.—A paper was read, *On the structure of the Tarsus in the Tetramerous and Trimerous Coleoptera of the French Entomologists*; by W. S. MacLeay, Esq. M.A. F.L.S.

February 15; and March 1 & 15.—The reading of Messrs. Sheppard's and Whitear's Catalogue was continued.

ZOOLOGICAL CLUB OF THE LINNEAN SOCIETY.

January 11, 1825.—Mr. Vigors exhibited to the Meeting some species of the Australasian genus *Platycercus*, belonging to the family of *Psittacidae*, which he had lately characterized: and he pointed out the distinguishing peculiarities of the genus, the number of known species contained in it, and its geographical limits. He thence took the opportunity of adverting to the importance of the characters by which modern ornithologists are guided in separating the groups of birds; dwelling on the present occasion more particularly on the points of distinction afforded by the different structure of the wing. These characters he asserted to be of essential consequence, not only as being subject to no variation, but as being derived from that part of the structure of Birds which separates them from the other Vertebrated Animals, and, as such, being most conducive to the knowledge of their peculiar economy. He illustrated the difference in these characters of the wing in many of the leading groups of Ornithology; and he pointed out the adaptation of such characters to the habits of life, and the

natural station of the birds in which they are found. In the course of these observations he adverted to the importance of the modern generic characters in leading to a just discrimination even of species; and he brought forward some instances, where different species, bearing a general resemblance to each other in colour and external appearance, have been confounded together in consequence of a want of attention to minute but essential generic characters.

In the discussion which ensued, Mr. W. S. MacLeay mentioned in illustration of the importance which is to be attached to minute generic characters as affecting the distinction of species, the fact, that Linnæus, having the two insects before him, confounded together under the name of *Scarabæus pilularius* an American and an European insect. These, although analogically so like as to be scarcely distinguishable as species in a rudely constructed genus, are evidently, on the examination of the characters which modern naturalists have considered sufficient to distinguish genera, referable to distinct groups; one of them being *Ateuchus volvens*, MacL., and the other *Gymnopleurus pilularius*, Ill.

Mr. Gray being referred to by the Secretary, adduced another instance in illustration of the same fact, in the circumstance of the *Ursus Arctos*, Linn., and the *Ursus ferox*, Lew. and Clarke, having been confounded together; an error which has been retained even in the publication of M. Desmarest. These animals, however, although apparently agreeing in general points of resemblance, differ in the structure of their claws, which evinces an important difference in their economy; the claws of one being adapted to climbing trees, whilst those of the other are designed for burrowing.

Dr. Such, in like manner, added his testimony in corroboration of the importance of generic characters as serving to distinguish species. He observed, that in endeavouring to ascertain the names of several species of the *Columbidæ*, which he had lately brought from Brazil, he found considerable difficulty in distinguishing them, in consequence of the similarity that prevails among the specific descriptions hitherto given by naturalists: and that he was ultimately led to the knowledge of these species by attending to some minute generic characters which were subsequently pointed

out to him as distinguishing the subordinate groups of that extensive family.

January 25.—A paper entitled “Observations on the structure of the *tarsus* in the Tetramerous and Trimerous Insects of the French Entomologists,” was read by W. S. MacLeay, Esq. M.A. F.L.S.

February 3.—Mr. Bichenô exhibited a specimen of *Procellaria pelagica*, Linn., which had been shot in the neighbourhood of Newbury, in Berkshire, in November last. This is one of the rare instances in which this oceanic bird has been met with so far inland.

Mr. Vigors exhibited a diagram representing the five orders of Ornithology, and the circular series in which they return into themselves, according to the views which he had represented in a paper “On the Affinities of Birds,” laid before the Club on the 9th of December, 1823, and subsequently read before the Linnean Society during the course of the last year. He explained the nature of the typical characters by which these five orders are separated from each other, and at the same time the affinities by which they are connected together. He signified his intention of occasionally illustrating this subject both in the more comprehensive and more minute groups of Ornithology, according as the leisure of the Club will permit, by exhibiting specimens of those birds in which the distinguishing characters as well as the connecting affinities are most fully developed,

February 22.—Capt. King, R.N. F.R. & L.S. exhibited specimens of several subjects of Zoology collected in the Indian ocean, between the Island of Mauritius and New Holland, in the year 1822. Among them were specimens of the following genera; *Hyalæa*, *Clio*, *Spirula* and *Pentalasmis*, with an undescribed species of *Achatina*, found upon Bald Head, King George’s Sound, S. W. Coast of New Holland; of *Cilicia*, *Idotea*, with *Alima vitrea*, (*Cancer vitreus* of Banks and Solander); *Porpita*, and several *Zoophytes*. Specimens were also exhibited by Captain King of several species of Fishes, among others a species of *Balistes*, two of *Lophius*, one of which appears to be the *Cheironectes tuberosus* of M. Cuvier, and a specimen of *Gasterosteus ductor*.

The Secretary exhibited a specimen of the genus *Anas* of Linnaeus which had been taken alive in a decoy near Yarmouth, in Norfolk, and which had been communicated by Mr. Weighton for the information of the Club. It appeared to be a variety of the *Anas boschas*, Linn.; but as it deviated from that species in several characters, more particularly in the structure of the tail, the Secretary proposed to give the bird a further examination and to detail the results of it to the Club.

Mr. W. S. MacLeay entered into a dissertation on the Affinities and Analogies which connect together the principal subdivisions of the Linnean genus *Scarabæus*, all of which he illustrated by a reference to the figures of the different parts of the structure of the insects of that genus, and also to the insects themselves, which he exhibited to the Meeting.

March 8.—Captain King exhibited specimens of the following New Holland Birds which he stated his intention of presenting to the Linnean Society: viz. *Halcyon sacra*; *Barita tibicen* adult and young; some species of *Meliphaga*; an undescribed *Hæmatopus*; *Rallus torquatus*, *Aptenodytes minor*, *Tachypetes aquilus*; an undescribed species of *Larus* shot in King George's Sound, which he denominated *L. Georgii*, and two undescribed species of *Sterna*.

In the course of some observations which followed on the subject of New Holland Birds, it was stated that the original English name of Mr. Lewin's *Meliphaga chrysocephala*, (*Sericulus chrysocephalus*, Swains., *Oriolus regens*, Temm.) was *King's Oriole* or *Honeysucker*, so called after Governor King, who first discovered the bird and sent it to England. The original specimen sent home by him is at present preserved in the collection of his family. It was also observed that the well known species of Parrot, the *Platycercus scapulatus*, commonly called the *King Parrot*, was also originally called *King's Parrot* after the same gentleman.

A "Notice on a peculiar property of a species of *Echinus*," by Mr. E. T. Bennett, was read by the author.

March 22.—Mr. Broderip exhibited a portion of a decayed Elm, which he had received from H. Bright, Esq. M.P., and requested information as to the cause of the decay, and whether it originated in the ravages of an Insect. As however the only

larva which could be detected in it was that of a dipterous insect, Mr. W. S. MacLeay stated it as his opinion, that this could not be the cause of the damage; but that the injury having been produced by some coleopterous larva, or other cause, the juices of the tree had flowed through the wound, and become putrescent, thus affording a nidus for the dipterous larva discovered.

A portion of a "Catalogue of the New Holland Birds in the collection of the Linnean Society," by Thomas Horsfield, M. D. F.L.S., &c. and N. A. Vigors, Esq. M.A. F.L.S. was read by Mr. W. S. MacLeay.

GEOLOGICAL SOCIETY.

January 21, 1825.—A paper was concluded, entitled, *On a recent formation of fresh-water Rock Marl in Scotland, with remarks on Shell Marl and on the Analogy between the ancient and modern fresh-water formations*, by Charles Lyell, Esq. Sec. G.S.

The rock marl described in this communication is an extremely compact limestone, in part of a crystalline structure, and traversed by numerous irregular tubes or cavities.

As a principal part of its geological interest is derived from its recent origin, the author has drawn a brief sketch of the physical structure of the county of Forfar, in order to explain distinctly its position.

Those strata are also enumerated in which limestone is found, and its remarkable scarcity in Forfarshire pointed out.

The districts to which shell marl is confined are next considered, and it appears that deposits of this nature are accumulated only in lakes in two formations; viz. the inferior or transition sandstone, and the old red sandstone.

The Bakie Loch, in which the rock marl occurs, lies in a hollow in sand and gravel. This gravel consists of the broken and rounded masses of the primitive rocks of the Grampians, which are heaped in large quantities upon the old red sandstone in the valley of Strathmore.

The succession of the deposits of sand, shell marl, and rock marl, in the lake of the Bakie now drained, is then described. The shells and plants enclosed in the rock are the same as those

in the soft shell marl, and are all still living in the waters on the spot. Among the plants are the stems and seed vessels of *Chara*, the latter being fossilized in such a manner as to present a perfect analogy to the Gyrogonite of the ancient fresh-water formations.

Mr. Lyell then considers the probable origin of the rock marl, which appears to be derived from subjacent shell marl, through which springs ascend, charged with carbonic acid.

Some remarks are next offered on the shell marl of Forfarshire, and some which the author has examined near Romsey, in Hampshire, is described. The subjects of chief interest with regard to the shell marl are, its slow growth, the small proportion of full grown shells which are found in it in Forfarshire, the greater rapidity of its growth in the vicinity of springs, its abundance in a part of Scotland in which limestone is very rare, and its scarcity in the calcareous districts of England.

The question is then considered whether the shell marl be exclusively derived from the exuviae of testacea, and the various arguments for and against this hypothesis are entered into.

In conclusion Mr. Lyell takes a general view of the analogy between the ancient and modern fresh-water formations.

Both of these may be described, generally, as consisting of thin beds of calcareous, argillaceous, and arenaceous marls, together with strata of sand and clay, to which the consolidated beds bear upon the whole but a small proportion.

The shells and plants contained in both are referable to the same genera.

The bones and skeletons of quadrupeds are found buried at various depths in the marls of Forfarshire, as they occur in the lower fresh-water formation of Paris.

Of the four desiderata mentioned by Messrs. Cuvier and Brongniart, (Ess. on the Env. of Paris, p. 56.) as being requisite to complete the analogy between the deposits of lakes now existing and those of a former world, three are supplied by the lakes in Forfarshire, viz. 1. a compact limestone; 2. vegetables converted into the substance of their calcareous matrix; 3. large beds of yellowish white calcareous marl.

The rock marl of Forfarshire closely resembles the Travertino of Italy, part of which is a recent formation, but part has been

proved by M. Brongniart to be of a date probably as ancient as the upper fresh-water strata at Paris.

The only difference remaining between the ancient and the modern fresh-water formations is, 1. the absence in the latter of silica, which is only known as a modern deposit from water connected with volcanic agency; and 2. the small scale on which the recent accumulations proceed.

If these differences are ascribable to a higher temperature prevailing where the ancient fresh-water rocks were formed, they may perhaps disappear when the hitherto unexplored tropical regions of the globe are fully investigated.

A paper was also read, entitled, *On the Fresh-water formations recently discovered in the environs of Sete (Cette), at a short distance from the Mediterranean, and below the level of the Sea*; by M. Marcel de Serres, Prof. of Min. & Geol. to the Faculty of Sciences of Montpellier.

The fresh-water formations described in this communication have been examined by means of several wells sunk at about the distance of three-quarters of a mile, and a mile and a half, from the Mediterranean, near Sete, in the South of France.

A detailed account is given of the several strata passed through in the three different wells, and of the organic remains which they contained.

The strata are for the most part parallel and nearly horizontal.

From the sections it appears that there are two fresh-water formations with an intervening formation of marine origin. The strata of the upper fresh-water were found to vary from about 30 to 40 feet in thickness, those of the lower from 13 to 28 feet, the latter being sometimes lower than the present level of the Mediterranean.

The marine beds which are interposed are from 10 to 11 feet thick.

The fresh-water strata are composed of numerous alternating calcareous and argillaceous marls, and compact limestones; and their organic remains consist of a few bones of land quadrupeds much decayed, a variety of fresh-water and terrestrial shells, the latter in the greatest abundance; the shells differing in species but not in genera from the present inhabitants of the same country; and lastly some traces of vegetables, chiefly reeds.

The marine formations contain *ostrea*, *cerithæa*, &c.: a complete list is added of the organic remains; and from the state of preservation in which the fresh-water shells are found, M. Marcel de Serres infers that they lived and were deposited where they are now found; and from the resemblance of those occurring in the upper and lower fresh-water beds, he concludes that the periods at which these two formations were deposited were not very remote from each other.

The author considers all these formations to be more recent than the Calcaire Grossière, and ascribes the alternations of marine and fresh-water strata to a return of the sea, such a supposition being rendered the more probable by the neighbourhood of the Mediterranean, where similar returns are still known to take place.

February 4. --On this day, being the Anniversary of the Society, the following gentlemen were chosen as Officers and Council for the year ensuing: *President*,—Rev. William Buckland, F.R.S. Prof. Geol. & Min. Oxford. *Vice-Presidents*,—Sir Alexander Crichton, M.D. F.R. & L.S. Hon. Memb. Imp. Acad. St. Petersburg; William Henry Fitton, M.D. F.R.S.; Charles Stokes, Esq. F.R.A. & L.S.; Henry Warburton, Esq. F.R.S. *Secretaries*,—Charles Lyell, Esq. F.L.S.; George Poulett Scrope, Esq.; Thomas Webster, Esq. *Foreign Secretary*,—Henry Heuland, Esq. *Treasurer*,—John Taylor, Esq. *Council*,—Hon. Henry Grey Bennet, M.P. F.R.S. & H.S.; Richard Bright, M.D. F.R.S.; Sir Henry Bunbury Bart.; Henry Burton, Esq.; William Clift, Esq. F.R.S.; Henry Thomas Colebrooke, Esq. F.R.S. L. & E. F.L. & Asiat. Soc.; George Bellas Greenough, Esq. F.R. & L.S.; Thomas Horsfield, M.D. F.L.S.; Gideon Mantell, Esq. F.L.S.; Hugh Duke of Northumberland, K.G. F.H.S.; William Haseldine Pepys, Esq. F.R.S. L.S. & H.S.; John Vetch, M.D.

March 4.—A notice was read *On the Bones of several Animals found in Peat, near Romsey, in Hampshire*; extracted from a letter from Charles Daman, Esq. to the Rev. W. Buckland, P.G.S.

Mr. Daman mentions that the skulls of several beavers, as well as the bones of oxen, swine, stags and roebucks, have been dug out of the peat near Romsey, and out of the shell marl, provin-

cially termed "malen," which occurs in the same alluvial tract. In one place several human skeletons have been taken out of the marl.

April 15.—An extract of a letter was read from Jeremiah Van Rensselaer, Esq. on the discovery of the skeleton of a *mastodon* at New York ; and of the tertiary formation in New Jersey.

In this letter Mr. Rensselaer mentions that in a late expedition which he had made with some friends to examine the geology of the state of New Jersey, they had discovered, disinterred, and afterwards brought to New York, the skeleton of a *mastodon* very nearly perfect. They also satisfied themselves that much of the region which lies between the Atlantic and the range of primitive mountains was referable to the tertiary formations, and that the secondary do not make their appearance for some hundreds of miles.

A paper was also read, entitled, *Account of a Fossil Crocodile recently discovered in the Alum-Shale, near Whitby*; by the Rev. George Young.

Mr. Young describes the osteology of this fossil animal, which has been deposited in the Museum at Whitby, and of which a drawing accompanied this communication ; its length exceeds 14 feet, and when perfect must have reached 18.

The author mentions that these are not the only remains of the crocodile which have been discovered near Whitby, although they had been generally confounded with those of the *Plesiosaurus*; of which animal, however, as well as of three or four species of the *Ichthyosaurus*, undoubted remains occur in the alum-shale of Whitby.

PORTSMOUTH AND PORTSEA LITERARY AND PHILOSOPHICAL
SOCIETY.

WE have much pleasure in noticing the progress of this association, as detailed in the report of its proceedings during the Session of 1823-4. By this report it appears that the Society has been rapidly advancing in improvement as it regards the number of its members, the increasing interest of the lectures and papers which have been read at the meetings, and the numerous addi-

tions which have been made to the library, the laboratory, and the museum. We are gratified to observe that considerable attention has been paid by the members to indigenous Zoology. This subject would receive the greatest improvement from the labours of such local societies as this, established in different parts of the country, from the opportunities both of observing the habits of native animals, and of ascertaining and registering the distribution of rare or local species.

The society consists at present of 158 members, James Cull, Esq. being the President.

ROYAL ACADEMY OF SCIENCES OF PARIS.

November 2, 1824.—M. Majendie read a continuation of his memoir on the fifth pair of nerves.—M. Loiseleur des Longchamps read a memoir on the means of obtaining several crops of silk in a year, succeeded by some observations relative to the history of silk-worms.

November 15.—M. M. Duméril, Cuvier, and Majendie delivered a report on M. Lauth's memoir respecting the lymphatic system in birds.

November 22.—M. Huzard, Junr. and M. Pelletier presented their work on the genus *Iirudo*.—M. Geoffroy Saint-Hilaire presented his Synoptic Tables, explaining the composition of the skull in man and in animals.—M. Latreille communicated an Analytical Table of the natural families of the animals constituting M. Cuvier's second division of the Animal Kingdom, the Mollusca.

November 29.—M. Laurencet read a memoir on the structure of the brain.

December 13.—M. de Ferrussac read a memoir on the Geography of the Mollusca.

December 20.—M. Desmoulins communicated the results of his observations on the nervous system of two species of *Petromyzon*.—M. Majendie read a memoir on a fluid which is found in the cavity of the vertebral canal and in part of the cranium in man, and in the *mammifera* generally; and on

December 27, he communicated verbally some new details on the subject: on opening the body of a man soon after death, he

found the vertebral canal entirely filled with the fluid, which surrounded the anterior nerves of the interiors, and equally separated the fibres of the nerves of sensation and of motion. It appeared, he stated, to be more abundant in man than in the other *mammifera*.—M. Flourens read a memoir on the brain of Fishes.

January 3, 1825.—M. Poisson was elected Vice-President for 1825; and M. Chaptal the Vice-President during 1824, entered upon his office as President for this year.—M. M. Duméril and Latreille presented a report on a memoir on Leeches, by M. M. Huzard and Pelletier.

The authors of this memoir had been commissioned to obtain information for the civil authorities, relative to the means to be employed for terminating the complaints often made to them respecting the bad quality of the Leeches used in medicine. The chief points they proposed to examine were, first, the causes which in certain cases render the little wounds made by these animals difficult to cure; and secondly, the circumstances under which certain Leeches do not penetrate the skin to which they are applied. On the first point, M. M. Huzard and Pelletier agree with physicians in acknowledging that the inconveniences ascribed to Leeches, should in most cases be attributed to the temperament of the patient, the nature of the malady, the means employed to detach them from the wound, or the foreign substances used to stop the bleeding and close the wound. With regard to the second point of inquiry, the authors of the memoir have ascertained that species of Leech are offered for sale which at first sight entirely resemble medicinal Leeches; but which differ from them in not having the serrated jaws proper for making the incisions in the skin from which the animal sucks, as well as in the conformation of the stomach and intestinal canal. They cannot be employed in medicine, for they do not bite. M. Dutrochet has already described the species of the *Annulosa* brought forward as new by M. Huzard and his Colleague, but various errors respecting it which occur in his work they have been enabled to correct, having made it an object of particular examination for the space of a twelvemonth.

M. Duméril made a report on M. de Ferrusac's Memoir on the animal of the genus *Argonauta*.

January 17.—M. Majendie announced that he had ascertained the insensibility of the retina, in a female on whom he operated for cataract; the contact of an instrument with that organ did not produce any appreciable sensation: the patient recovered her sight immediately after the operation.

M. de Basterot read his geological description of the tertiary district of the south-west of France, comprising some general remarks on fossil Mollusca.

M. Foderà announced that he should shortly communicate the results of his researches on muscular contraction, on the action of various agents on the nervous system and on muscular fibre, and on the formation of white globules analagous to the white globules of the blood. M. Giron de Buzareingue read the first part of a Memoir on the Generation of Animals.

January 24.—M. Gaymard read some observations on the *Biplores* and *Beroes*. M. Latreille communicated a notice respecting an insect of the genus *Brachycerus*, which is considered as a talisman by the females of the kingdom of Berta.

January 31.—Professor Briot, of Besançon, communicated a memoir entitled, *Considerations on the Lachrymal Ducts, their disorders, and the means of curing them*. M. Delapylaié commenced the reading of a Memoir on the *Encornet* of the French fishermen.—M. Majendie communicated an observation confirming his view respecting the so-called olfactory nerve, that it is not the nerve of smell: this was, that a man in whom the anterior part of the brain and the olfactory nerve had been altered or destroyed, still retained the sense of smell.

February 14.—M. Bailly communicated several results of an investigation in which he is engaged for the purpose of determining whether the births of males and females indicate any appreciable coincidence with physical causes: he announced a detailed memoir on the subject.

February 28.—M. Geoffroy St.-Hilaire read a memoir on the Natural Affinities of the Fossil Crocodile of Caen, and on the formation of a new genus from it, denominated *Teleosaurus*.

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Erratum in reference to Plate in P. 24: for *Plate I. fig. 7.*
read *Plate II. fig. 2.*

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THE
ZOOLOGICAL JOURNAL.

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ART. XVII. *On two new Genera of Birds, Formicivora and Drymophila, with Descriptions of several species.*
By WILLIAM SWAINSON, Esq. F.R. & L.S., &c.

IN the first part of my paper on the family of *Laniadae*, printed in this Journal (Vol. I. p. 290,) I have proposed to detach from the genus *Myothera* of Illiger, certain birds which have been associated with it by modern Ornithologists. Part of these, forming the genera *Formicivora* and *Drymophila*, were then but slightly noticed. It is therefore the object of this paper to explain the generic distinctions of these groups more fully; and to describe several species which belong to them. Both these genera will doubtless receive large additions, when all the American *Fourmiliers* of Buffon are better known, or more accurately described. But the *Fourmiliers* of M. Le Vaillant, (judging from the species discovered in Africa by my friend Mr. Burchell,) belong entirely to a distinct family; and by their depressed bill, shew a close affinity to the *Saxicolæ* or Stone-Chats.

FORMICIVORA.

Rostrum mediocre, subcylindraceum, gonyde rectâ; vibrissæ nullæ.

Alæ breves, rotundatæ, remige 4^{ta} vel 5^{ta} longissimâ.

Cauda gradata.

Tarsi mediocres, graciles; squamis lateralibus frequentibus.

VOL. II.

K

The *Formicivora* or Ant-Wrens, are all of them very small ; and in an artificial arrangement might very well be associated with the Warblers. In all but their slender bill, they present a perfect miniature resemblance to the true *Thamnophili*, even to the lateral scales of their tarsi, which are small and numerous. They differ from the *Drymophila* by their comparatively short legs, which are obviously not intended for walking. We know little of their natural economy, further than that they frequent bushes and the low branches of trees, which they probably cleanse of those small insects, passed over by their more powerful brethren.

I should have had some hesitation in placing this group of little birds, so near to that which comprises the powerful *Thamnophili*, but for the figure and description of the *Fourmilier tachet*, given in the Planches Coloriées, Pl. 179, f. 1. 2. It will be perceived that in the series of *Thamnophili* described in the last number of this Journal, the species are characterized by a shorter and more rounded tail, and that they gradually diminish in size until we reach *T. ferrugineus*, which is less than a Sparrow. The *Fourmilier tachet* is even smaller ; yet, in its strong and compressed bill, and short rounded tail, it exhibits the two most prominent characters of the lesser *Thamnophili*. To that group it may, therefore, safely be referred.

On the same plate is figured another bird, (also referred to the genus *Myothera*,) by the name of *Fourmilier gorgeret*. It is of the same size as the last, but with a bill much more slender, and, to all appearance, perfectly agreeing with that of *Formicivora*. Here then we may fairly presume that the passage from one group to the other takes place.

We cannot be sufficiently thankful to M. Temminck, (however the above inference may militate against his own particular views) for having furnished us with the means of tracing one of those beautiful gradations, by which natural groups are insensibly united.

The short tailed *Thamnophili* may perhaps hereafter be found sufficiently numerous to constitute a separate genus ; but in our present state of knowledge, they may be considered as forming only a sectional division.

1. FORMICIVORA maculata.

White spotted Ant-Wren.

F. supra atra maculis albis frequentibus interstincta, infra cinerea nigro varia; secundariis apice fulvo; caudâ gradatâ.

Above black with numerous white spots, beneath cinereous white varied with black, lesser quills tipped with fulvous, tail graduated.

Description.

In the general cast of its plumage this little bird presents a miniature resemblance to *Thamnophilus maculatus*. It is about the size of the Wood-Wren, having the upper mandible of the bill black, and the under horn colour. The wing covers and all the upper plumage is deep black, variegated by numerous tear-shaped spots of pure white. On the head these spots are so disposed, as to form macular bands over the eyes, leaving the middle of the crown and a stripe above the ears, entirely black. The under plumage is cinereous white, with the middle of the feathers black, particularly on the breast and body, where this black colour forms spots. The quill feathers are brownish, margined by light grey; and each of the lesser quills is tipped by a round spot of fulvous white. Tail rather lengthened, much graduated, the feathers being moderately pointed; their colour is black tipped with white, and crossed by three interrupted white bands. Tarsi rather short, weak, and pale.

Total length 5 inches; bill, $\frac{6}{18}$; wings, 2; tail, $2\frac{1}{2}$; tarsi, $\frac{6}{18}$.

My specimen of this bird was sent me by Dr. Langsdorff, from the Mining District of Brazil. It has all the indications, in the distribution of its colours, of being a male.

2. FORMICIVORA nigricollis.

Black throated Ant-Wren.

F. supra griseo-fusca, jugulo pectore abdomineque nigris; lateribus strigâque oculari niveis; caudâ elongatâ, gradatâ, nigrâ, apice albo.

Male. Above greyish brown; throat, breast, and middle of the body black; sides and eye-stripe snowy; tail graduated, black, tip with white.

Female. Ferruginous brown above; sides of the body testaceous; middle tail feathers brown.

Description.

Size of the Wood-Wren. Bill black. The general tint of the *upper plumage* in the male is grey; but in the female it is ferruginous; more particularly on the lower part of the back; the margins of the *quill feathers* are the same, the *quills* themselves being brown. The sides of the *head*, ears, and fore part of the neck, and *breast* and *body*, are covered by a large patch of black which extends to the vent; and is margined on each side by a white line, which passes over the eyes and ears, becomes wider on the sides of the breast and body, leaving the *flanks* and *belly* in the male pure white, but tinged with ferruginous in the female. The *wings* are very short, the covers are all black, marked by snow white spots; spurious quills the same. *Tail* lengthened and cuneated; the middle pair being more than an inch longer than the outer pair; those which intervene are progressively graduated; they are all black, with obtuse white tips, except the middle pair, which are greyish towards their base. *Tarsi* moderate, slate coloured.

Total length, $4\frac{1}{4}$ inches; bill, $\frac{7}{10}$; wings not quite 2; tail, $2\frac{1}{2}$; tarsi, $\frac{1}{4}$.

Obs. I met with both sexes of this species in the Catinga woods of Humildez. A specimen of the male is in the Cabinet of Mr. Vigors.

3. FORMICIVORA *brevicauda*.

Short tailed Ant-Wren.

F. cinerea; jugulo pectoreque nigris; scapulis maculisque tectrices ornantibus albis; caudá brevissimá.

Cinereous, middle of the throat and breast black, shoulders and spots on the wing covers white; tail very short.

Description.

This diminutive bird does not exceed in size the Golden-crested Wren. It is remarkable for its short *tail*; which, from being more than half concealed by the long and lax plumage of the back, appears still shorter. The ground colour both of the *upper and under plumage* is pure cinereous or slate grey. From the *chin* to the middle of the *body* runs a narrow stripe of black, which widens on the breast: the *shoulder covers* are pure white, and the greater and lesser *wing covers* deep black, tipped by white spots. The *tail* is rounded, fasciculated, and only extends half an inch beyond its covers; the feathers are black, tipped with white, particularly the outer pair. The *tarsi* are short, and only half an inch long; like most of the American *Thamnophili* they are naturally blueish black.*

Total length, $3\frac{1}{2}$ inches; bill, $\frac{6}{10}$; wings, 2; tail, $1\frac{2}{10}$; tarsi, $\frac{1}{2}$.

Found in the same place as the preceding. I have but one specimen, and that is a male.

DRYMOPHILA.

(See Zool. Journal, Vol. I. p. 302.)

Rostrum mediocre, subcylindraceum, gonyde rectâ; vibrissæ nullæ.

Alæ mediocres, rotundatæ, remige quintâ longissimâ.

Cauda rotundata.

Tarsi elongati, subgraciles, squamis lateralibus integris.

There is reason to believe that a considerable number of birds arranged by Dr. Latham among the Thrushes, will hereafter be

* It will be observed that in these descriptions, I have paid little attention to the colours either of the bill or the tarsi, as seen in the dried specimens. From the changes these parts undergo after death, such characters can very seldom be depended upon. I have seen the same organ, in two different specimens, dry of different colours; and it will generally be found that the bill of a young bird, is much lighter than that of an adult.

removed into this group. Indeed, their general *habit* seems intermediate between the Thrushes and the Warblers of Linnæus. Like the *Thamnophili* they are only found in the hotter parts of America: from those birds they are readily distinguished by their more slender and somewhat rounded bill; and by the length of their tarsi, the lateral scales of which are in one entire piece. The little that I was able to learn of their economy, leads me to suppose they principally search for food upon the ground; their legs are consequently long, and, in some species, rather strong. They seem to prefer the deep and secluded recesses of the virgin forests; and in all probability derive their chief sustenance from the myriads of Ants which there abound.

1. *DRYMOPHILA Leucopus*.

White legged Ant-Thrush.

D. rufo-fusca; corpore infra albente; crisso, strigâ oculari maculisque tectrices nigras ornantibus fulvis; torque pectorali oblecto, nigro; tarsis albenibus.

Mas mento nigro; jugulo maculisque scapulares ornantibus, niveis.

FÆMINA mento juguloque fulvis.

Rufous brown, body beneath whitish; vent; eye-stripe, and spots on the black wing covers, fulvous; breast with a concealed black collar; legs whitish.

Male. Chin black; throat and spots on the shoulder covers snowy.

Female. Chin and throat fulvous.

Description.

This is certainly the most elegant bird of this group we are yet acquainted with. The two sexes differ so much, that their descriptions, in some measure, must be distinct; while those characters common to both, are at once seen in the specific character.

Male. Size rather less than the Robin. The bill is black, and but little compressed. The ground colour of the upper plumage,

including the quills and tail, is ferruginous brown, darkest on the head; the feathers on the *back*, when raised, are seen to be pure white for about half their length; they are then obliquely banded by black, while their remaining or external portion is of the same colour as the parts adjacent: the white colour of course is entirely concealed, so also, in part, are the black bands; the feathers on the *rump* are remarkably long. From the nostrils commences a broad band (which at first is white, but gradually becomes fulvous,) passing over the *eyes* and half way down the *neck*, leaving the *ears* and the *sides of the head and neck* deep black; the *chin*, in this sex, is also black, and the *throat* pure white: across the upper part of the *breast* is a half concealed collar of black, the margins of the feathers being white, but those on each side the breast tinged with cinereous; the middle of the *body* is white; the *flanks* light ferruginous, and the *under tail covers* fulvous or deep buff colour. The *wing covers* are deep black, those on the shoulder, and the lesser series, are each tipped with a snow white spot; while the greater covers and the spurious quills are spotted with buff. *Tail* moderate and graduated, the outer feathers being only half the length of those in the middle. *Tarsi* rather lengthened; *claws* moderate. In a preserved state these parts are yellow, but in the recent bird they, as well as the irides, are almost white. *Wings* short and feeble.

Female. This sex differs in the following particulars. The under mandible of the bill is pale. The concealed white spot on the back is less: the line above the eye, as well as all the round spots on the wing covers, are entirely buff: and the whole of the *chin* and *throat* is buff coloured yellow. The sides of the *breast* are dusky brown, without any mixture of cinereous; and the black collar round the *throat* is nearly obsolete.

Total length, $5 \frac{1}{2}$ inches; bill, $\frac{1}{4}$; wings, $2 \frac{1}{8}$; tail, $2 \frac{1}{2}$; tarsi, $\frac{1}{8}$.

Obs. My hunters were fortunate in procuring two pair of these beautiful little birds, in the forests of Pitangua near Bahia. I had therefore full proof of their identity as one species.

2. *DRYMOPHILA longipes*.

Long legged Ant-Thrush.

D. supra rufa; genis cinereis; jugulo pectoreque nigris; corpore albo; tarsi longis, pallidis.

Above rufous; sides of the crown cinereous; throat and breast black; body white; legs elongated, pale.

Description.

Rather larger in size than a Lark. *Bill* black. The whole of the *upper plumage*, including the wings and tail, is bright rufous; but the *crown* is more dusky, and is margined above the *eyes* and *ears* by a broad and clear cinereous stripe. The *front* is of an obscure cinereous, with the shafts of the feathers black, rigid, and shining. The *throat* and *breast* are deep black, and this colour spreads over the sides of the head and the ear feathers; the rest of the *under plumage* is white, but the *flanks* and under tail covers are ferruginous. The *wings* are short, feeble, and much rounded; the *tail* also is rounded, rather short, and the feathers narrow, the colour of both is rufous. *Tarsi* pale, and very long.

Total length, $6\frac{1}{4}$; bill, $\frac{9}{16}$; wings, $2\frac{1}{2}$; tail, $2\frac{1}{2}$; (the outer feather $\frac{6}{16}$ shorter,) tarsi, $1\frac{2}{8}$.

Obs. I have never seen more than one specimen of this extremely rare species. It was brought from some part of Brazil, (I was told from Rio de Janeiro,) and is now in my collection.

3. *DRYMOPHILA trifasciata*.

White shouldered Ant-Thrush.

D. atra; scapularibus, interscapularibus, tectriciumque fasciis 2 niveis.

Black; shoulder covers, interscapulars, and two bands on the wing covers snowy.

Description.

Somewhat larger than the last; but the *bill* is a tenth of an inch shorter. The ground colour of the *whole plumage*, both above and beneath, is deep and uniform black. A broad band of snowy white

passes over the *shoulder covers*, and two other bands, much narrower, are formed by the white tips of the greater and lesser *wing covers*. The feathers in the middle of the *back* are also pure white, banded with black across their extremities; so that when undisturbed, the white portion is almost hid. The *wings*, although rounded, are longer and more robust than those of the two preceding species; the same may be said of the *tail*, the feathers of which are broad and obtuse. *Tarsi* rather strong and black.

Total length 7 inches; bill, $\frac{5}{16}$; wings, $3\frac{3}{16}$; tail, 3; tarsi, $1\frac{1}{16}$.

Obs. My specimen is a male, and was sent me from Southern Brazil. Dr. Such has also met with this species in the same part, to which it is, in all probability, chiefly confined.

4. *DRYOPHILA atra*.

Black Ant-Thrush.

D. atra; interscapularium basi margineque niveis.

Black, base and margins of the interscapular feathers snowy.

Description.

This is closely allied to the last, in every thing but the white bands on the wings, which are altogether wanting. The bill also is longer. The whole plumage is deep and uniform black. Like the last species, this also has a concealed spot of white on the back; but instead of the feathers being *banded* with black at their tips, they have a tear-shaped spot of that colour, so that the white margin appears externally when the feathers are smooth. The wings are shorter, and the tail, although similar in form, is more graduated than in *D. trifasciata*. The *irides* are large, and bright crimson.

Total length, 7 inches; bill, $\frac{9}{16}$; wings, 3; tail, 3; tarsi $1\frac{1}{16}$.

Obs. I shot three or four individuals of this species, (all of which were males,) in the woods of Pitangua, in the province of Bahia. They were generally seen upon the ground, searching

apparently after Ants and other terrestrial insects. The females both of this, and the last species, when known, will probably be found to differ remarkably in colour from the other sex.

N. B. Another species, which may prove to be undescribed, is in the cabinet of Mr. Vigers.

ART. XVIII. *Description of a new Genus of Mammiferous Quadrupeds of the Order Edentata.* By RICHARD HARLAN, M.D. Professor of Comparative Anatomy to the Philadelphia Museum, Member of the Am. Phil. Soc., &c. &c.*

On the 18th of December, 1824, Mr. William Colesberry of Philadelphia, presented to the Philadelphia Museum of Natural History the interesting animal which forms the subject of the following pages. Mr. C. gave the following statement to Mr. Franklin Peale :—"The animal is a native of *Mendoza*, and in the Indian language is named '*Pichiciago*.' *Mendoza* is situated in the interior of *Chili*, on the east of the *Cordilleras*, in lat. 33° 25' and long. 69° 47', in the province of *Cuyo*. It had been obtained on the spot, in a living state, but it continued to live in confinement only a few days. Its habits resemble those of the mole, living for the most part under ground ; and is reputed to carry its young beneath the scaly cloak with which it is covered ; and that the tail possessed little or no motion."

It is to be regretted that the viscera and the greater portion of the skeleton of this animal had been removed before it came into my possession ; and the gentleman who presented the same, having left the city, precludes the possibility of receiving, at present, any further particulars relative to its habits ; but the observations which I have been able to make from the examination of its exterior, together with the skull and teeth, all of which are in nearly a perfect state of preservation, establish the characters of the animal on the most solid foundation.

* From the Annals of the New York Lyceum of Natural History, Vol. I.

Cuvier, that justly celebrated naturalist, remarks: "In zoology, when the teeth and jaws of an animal are given, the remaining structure may be readily determined; at least as far as relates to essential characters." The form of the tooth determines that of the condyle; the form of the scapula, that of the nails; just as the equation of a curve indicates all its properties; as in taking each property separately for the basis of a particular equation, we might arrive, not only at the *ordinary* equation, but at all the other properties; so the nail, the scapula, the maxillary condyle, the femur, and all the other bones, taken separately, would indicate each other reciprocally; and beginning with either separately, we might, according to the rational laws of the organic economy, construct the whole animal."

It is thus, by a perfect knowledge of the laws of co-existence, to which the combinations of animals are subjected, the skull alone of the animal under consideration would have enabled us to determine that it belonged to a new, and nondescript genus.

The varied, magnificent, and multiplied collection of natural objects, in the Philadelphia Museum, drawn from every department of nature, displays in the strongest light the wonderful results to be obtained, by the talent, industry, perseverance, and zeal, of an individual. The venerable octo-genarian *founder* still lives, to contemplate with sentiments of pride and delight the colossal monument which has risen at his command; which will perpetuate the fame, and hand down the name of *Charles Wilson Peale* to the latest posterity.

On the present occasion, as on many others, I have been indebted to the Philadelphia Museum, for the opportunity of making the clearest illustration of the subject of investigation. I have also to congratulate myself in the acquaintance of Mr. William W. Wood, a young, but zealous naturalist, whose talents as a faithful delineator of nature, have only to be known, to be duly estimated.

The order Edentata includes quadrupeds destitute of incisor teeth, forming the last order of Cuvier's clawed animals. Although united only by a negative character, there exist some positive relations between them, particularly the large nails which

embrace the extremity of the fingers, and resemble more or less the nature of hoofs.

CHLAMYPHORUS TRUNCATUS.

Corpore, suprà testá coriaceá, postice truncatá, squamis rhomboideis, lineis transversis dispositis, conflatá, subtus capillis albis, sericeis, oblecto; capite suprà squamis testá dorsali continuis, adoperto; palmis, plantisque pentadactylis; unguibus anterioribus longissimis, compressis; marginibus externis, mucronibusque acutis; caudá rigidá, sub abdomine inflexá.

Tab. vi.

DIMENSIONS.

	Inches.
Total length	5·2
Length of the head	1·6
Breadth between the eyes	0·8
Depth of the posterior truncated portion of the shell	1·3
Greatest breadth of the same	1·8
Girth posterior to the shoulders	4·0
Length of the sole of the foot, including the nails	1·2
Breadth of the foot	0·3
Length of the nails	0·2
Length of the hand	1·4
Breadth of ditto	0·4
Length of the longest nail	0·7½
Length of that portion of the tail which is free, and curved beneath the body	1·2

The shell which covers the body is of a consistence somewhat more dense and inflexible than sole leather of equal thickness. It is composed of a series of plates of a square, rhomboidal, or cubical form; each row separated by an epidermal or membranous production, which is reflected above and beneath, over the plates; the rows include from fifteen to twenty-two plates; the shell being broadest at its posterior half, extending about one half round the body; this covering is loose throughout, excepting along the spine of the back and top of the head; being attached to the back immediately above the spine, by a loose cuticular

production, and by two remarkable bony processes (to be described hereafter) on the top of the os frontis, by means of two large plates, which are nearly incorporated with the bone beneath; but for this attachment, and the tail being firmly curved beneath the belly, the covering would be very easily detached. The number of rows of plates on the back, counting from the vertex, (where they commence) is twenty-four; at the twenty-fourth the shell curves suddenly downwards, so as to form a right angle with the body; this truncated surface is composed of plates nearly similar to those of the back; they are disposed in semicircular rows, five in number: the lower margin somewhat elliptical, presents a notch in its centre, in which is attached the free portion of tail, which makes an abrupt curvature, and runs beneath the belly parallel to the axis of the body; the free portion of tail consists of fourteen caudal vertebræ, surrounded by as many plates, similar to those of the body; the extremity of the tail being depressed, so as to form a paddle; the rest of the tail compressed. The caudal vertebræ extend up to the top of the back, beneath the truncated surface, where the sacrum is bent to meet the tail. The superior semicircular margin of the truncated surface, together with the lateral margins of the shell, are beautifully fringed with silky hair.

Head: posterior half, broad, anterior half, before the eyes, tapering; the occiput is covered by the five first rows of the *back plates* with which they are continuous; the occiput not distinguishable externally. The anterior half of the top of the head, is covered, first, by a row of large plates, five in number, which are firmly attached to the bone beneath; particularly the two outer;—secondly, by a smaller row, six in number, anterior to which, that is to say, the top of the snout, is covered with smaller plates irregularly disposed.

External ear, consists of a circular, somewhat patulous opening, directly posterior to the eye, surrounded with an elevated margin, and communicating with a bony canal, to be more fully described hereafter. *Eye,* minute, totally black; and, like the ear, nearly hidden by long silky hair.

Mouth, the rictus small. *Nose;* the extremity of the snout is

furnished with an enlarged cartilage, as in the hog; the anterior nares opening downwards at the inferior border.

The whole surface of the body covered with fine silk-like hair, longer and finer than that of the mole, but not so thick set. The anterior of the chest is large, full, and strong; the anterior extremities, short, clumsy, and powerful; the hair is continued for some distance on the palm—the phalanges of the hand united; five powerful nails rising gradually one above the other; the external shortest and broadest; the whole so arranged as to form a sharp cutting instrument, somewhat scooped; very convenient for progression under ground; and such as must very much impede motion on the surface. Hind legs weak and short—feet long and narrow; the sole resembles considerably the human foot, having a well defined heel, which rests flat upon the ground, and being arched in the middle; toes separate, nails flattened horizontally.

Skull. At first view, the bones of the cranium and face would appear to constitute one solid case, the remnants of sutures are indistinctly visible in some parts only. The cavity of the cranium is capacious; the greatest breadth, which is from ear to ear, is one inch; the greatest depth five-tenths; length of the cavity, seven-tenths. One of the most remarkable peculiarities of this skull, consists in the two processes of bone above alluded to, which project obliquely, forward, upward, and outward; from the os frontis, anterior to the cavity of the cranium, and directly above the malar bone; giving to the front of the skull an aspect totally unique; these prominences are hollow, communicating with the frontal sinuses, and must contribute in a great measure to enlarge the organ of smell: there exists a considerable concavity between them, which in the recent state, was filled with an adipose, gristly mass, which served to unite the skull to the plates above. The snout commences anteriorly to these processes, and is rapidly attenuated and depressed. The *ossa nasi* are broad and strong, slightly arched transversely, extending anteriorly beyond the os incisivum, as does likewise the osseous septum narium. The zygomatic processes are laterally arched; a small pointed process, descending near the malar bone (somewhat like that in the sloth); the zygomatic fossæ are large.

The labyrinth is protuberant and occupies the usual situation at the base of the skull ; joined to which is the tympanum ;—to the last is attached a bony cylinder stretching first upwards behind the zygomatic process of the temporal bone, around which it makes a sudden curve, and runs forward and upwards to terminate at the external ear.

Lower jaw. Anterior portion shaped like that of the elephant, much elongated ; the general form and proportion resembles very closely the lower jaw of the sheep, the base being considerably arched, and the curve at the posterior part, forming with the base nearly a right angle, projecting obliquely outwards ; the base is marked by eight slightly elevated protuberances, occasioned by the roots of the teeth ; the condyloid process is longer than the coronoid ; in the sheep this is reversed : the articulation at the glenoid cavity as such as to admit of great freedom of motion. Length of the base of the lower jaw one inch ; length of the angle five-tenths ; greatest width two and a half tenths ; width of the angle three-tenths.

Teeth. Incisors, none in either jaw ; molars, eight in number, on either side of the upper and lower jaws, all approximate ; disposed in separate alveoli ; the crowns of the two first only, approach to a point, and thus much resemble canine teeth ; the six remaining are all nearly flat on the crowns ; their structure is simple ; a cylinder of enamel, of equal thickness throughout, surrounds a central pillar of bone ; there being no division into body and root ; the lower half is hollow, the cavity representing an elongated cone. In the lower jaw, the teeth penetrate its whole depth ;—length of the teeth, about three-tenths of an inch : two-tenths of which are buried in the sockets—diameter, about one-tenth. They are somewhat flattened on the sides, and in a slight degree curved externally, to be adapted to the shape of the jaw. The teeth of the inferior maxilla are directed forwards and upwards ; those of the superior maxilla are directly reversed in their direction, so that the crowns meet each other obliquely ; and the posterior margin of the lower teeth, and the anterior margin of the upper, present their angles to the object of mastication.

The remainder of the skeleton, with the viscera, having been

removed previous to my obtaining a view of the animal, I am unable to give any further detail of the internal organization. It is fortunate that I have been enabled to make so complete a preparation of the skull; this, with the external organization, which is well preserved, will enable me to establish its generic characters on the firmest foundation.

To such as have made comparative anatomy the subject of their investigation, the above minute detail of this very extraordinary individual will enable them, in some measure, to anticipate the observations which follow; they will perceive at first view, that the animal before us unites in its external configuration traits peculiar to the genera *Dasypus*, *Talpa*, and *Bradypus*; yet a very superficial observation will unfold characters generically distinct from either. It will be observed, that though this singular being is clothed with a coat (or rather cloak) of mail, in a slight degree resembling the armadillo, yet it differs remarkably in its texture, form, situation, arrangement, and mode of attachment to the body. In the armadillo, the body is covered with a hard, scaly shell, and consists,—1st, In a plate upon the forehead. 2nd, A vast shield situate upon the shoulders, and formed of small rectangular compartments, disposed in transverse bands. 3rd, In bands of similar plates, but moveable and varying in number, from three to twelve more or less, according to the species. 4th, In a shield upon the rump, very similar to that on the shoulders. 5th, In rings more or less numerous on the tail; five toes behind; before sometimes five, at others four; hairs sparse. The whole shell is covered by a thin transparent epidermis, *which is joined to the skin of the belly*, which gives to the shell a shining aspect, as if it were varnished; the extremities are entirely covered with strong scales. The armadillo burrows in the earth; is sufficiently quick in its motions; is capable of rolling its body into the form of a ball; and is omnivorous. The external ear is sometimes large, and always very apparent.

From this statement, we are convinced that there exists only the most distant analogy in the external covering of the *Dasypus* with that of the *new genus*; other analogies, which are found in the comparison of the skulls, will be referred to hereafter.

The lower portions of our animal, as well as that beneath the scales, will bear a pretty close comparison with the same parts of the mole, (*Talpa Europæa*, Lin. white variety.) The hair is finer and longer than in the mole, and at a distance resembles long staple cotton in appearance. The eye is small; the neck, breast, and shoulders, are very powerful; the posterior extremities are short and weak; the anterior, short and strong, and furnished with large claws, as in the mole; but in the form of the head, in the structure and form of the claws, in the external ear, which is apparent when the hair is separated, our animal is totally dissimilar to the mole. The claws bear some analogy to the sloth, (*Bradypus*, Lin.), but are articulated to the last phalanx, as in the mole. Like the last named animal, the organs of generation must have opened anterior to the pubis, and at a great distance from the sacrum, viz. before the inferior margin of the truncated portion of the shell, near the middle of the caudal vertebræ, which, as I have remarked above, are continued, within the truncated plate, to near the top of the back. Thus far, like the mole, our animal is eminently constructed for subterranean progression; and here, in all probability, any strict analogy with that animal ceases.

In the examination of the skull, we are struck with its many peculiarities, and great dissimilarity to that of the mole, to which it is so nearly allied in its subterranean habits. The skull of the latter animal is long and narrow, flattened vertically; the jaws are furnished with four large canine teeth, separated from each other; having between them six incisors above and eight below, seven molars on each side of the upper jaw, six on each side below, the crowns of which are furnished with sharp points; in all of which our animal differs entirely. Like the mole, the extremity of the snout is furnished with a sort of button, but of much firmer consistence; in the form of the snout, and posterior part of the skull, as well as in the effaced appearance of the sutures, some slight resemblance is visible. The palm of the hand is directed rather inwards, in our new genus; whereas in the mole it is directed outwards, and the nails are destitute of the cutting edge, so remarkable in the former. On comparing

the skull of our animal with that of the armadillo, (*Dasypus sexcinctus*, Lin.) a few traits of similarity of typification are visible: both these animals being equally destitute of incisor and canine teeth in either jaw; in both, a considerable space intervenes between the anterior margin of the *os intermaxillare* and the commencement of the teeth; and in both the number of molar teeth is the same, viz. eight on each side of both jaws—thirty-two in all. Here all further analogy with the *Dasypus* is at an end.

In the last named animal, the crowns of the teeth terminate in two points, and, together with the bodies, are completely enveloped in enamel; they are so far separated from each other, that when the jaws are closed, those of the lower jaw pass between those of the upper; furthermore, the teeth are proportionally much shorter, neither sinking so deep into the jaw, nor rising so high above the alveoli. The whole form of the head, and of the jaws, particularly the inferior, will admit of no comparison in the two animals; lateral motion being almost entirely forbidden in the armadillo, and the greatest freedom in this respect existing in the *new genus*: in which, the *condyloid* extends above the *coronoid* process.

The teeth in structure are most nearly allied to those of the sloth, (*Bradypus tridactylus*, Lin.) that is to say, they consist of a simple cylinder of bone, surrounded with enamel, except the crowns, which are destitute of enamel in the centre; the roots, (or rather that portion buried in the jaw) of both these animals, are hollow. In these particulars, together with the short process descending from the zygomatic arch, which has been alluded to before, as well as in the form of the fore-claws, there is considerable analogy; but in all other points of organization these two genera are most widely separated.

As far as the nature of the subject will admit, I have now gone through with the detail of the organization of this most singular quadruped. During the investigation, I have had frequent occasion to admire those laws of co-existence which regulate the structure of organized beings; Nature, true to herself in this as in all other instances, has pursued an undeviating course. We have been presented in the subject before us with a *new form*:

an animal combining in its external configuration a mechanical arrangement of parts which characterizes, respectively, the armadillo, the sloth, and the mole ; constituting in themselves, individually and separately, of all other quadrupeds, those which offer the most remarkable anatomical characters. Pursuing the investigation step by step, with the skeletons of the above-named animals before me, it was not until after I had completely finished every point of observation, that I perceived in the skull alone, of the new animal, a reunion, more or less complete, of all those remarkable traits that an external view of the animal had offered for contemplation ; which, taken collectively, furnishes us with an example of organic structure, if not unparalleled, at least not surpassed in the history of animals.

The most peculiar and unique characters consist,—First, In the general contour of the animal. Secondly, In the form, texture, and disposition of its scaly cloak, which would very much confine the power of flexion and extension of the body, and nearly altogether impede lateral motion ; the greatest freedom of motion would consist in the extension of the head on the body. Thirdly, In the position of the organs of generation. Fourthly, In the form, structure, position, and use of the tail. Fifthly, In the peculiar and complicated structure of the feet and claws. Sixthly, In the structure of the organ of hearing. Seventhly, In the bony protuberances on the os frontis. Eighthly, In the disposition of the teeth ; and Ninthly, In the form of the lower jaw, which separates the animal, in this respect, from the order *Edentata*, and approximates it to the *Ruminantia* and *Pachydermata*.

ART. XIX. *An Inquiry into the true nature of Instinct, and of the Mental Distinction between Brute Animals and Man. Essay III. On the Specific Constitution of the Brute Mind, and its modifications under Human Influence: including an analysis of the theory of Brute Action contained in Dr. Hancock's "Essay on Instinct, and its Physical and Moral Relations."* By JOHN OLIVER FRENCH, Esq.

[Continued from page 83.]

There are, however, other considerations which enter into this portion of the subject. It would appear from the passage last quoted, as well as from his general views, that the author considers the Ideas and Memory of the Brute Animal as being altogether similar in their nature to the Ideas and Memory of Man: but he nowhere specifically discusses this point. I am, however, inclined to think that, in this respect, Brutes live in a mental world of their own, modified by their peculiar consciousness. But as the inquiry is connected with that of the supposed capability in brutes of a rational understanding of language; I shall consider these inquiries together, in adverting to the nature of the impressions produced by man upon domesticated animals.

The philosophy of the most barbarous language is formed:—
 1. Upon the consciousness of our own identity or individual existence. 2. Upon the consciousness of the existence of the external world around us. 3. Upon the consciousness of action or cause;—hence of a first or primary cause.—If I am *not capable* of a consciousness of the first, in an objective form; thus, if the constitution of my being is such that I cannot ever say to myself, "*I am*;" in this case, I cannot possess the capability of ever becoming conscious of the second; or of saying to myself, with respect to the external world—"that is." If I possess the capability of becoming conscious of the first and second; or of saying to myself, "*I am*," and "*that is*,"—I am obviously capable of becoming conscious of the third, or of saying to myself, "*Whence am I*," and

“ Whence is that ? From this it follows, that *to reason* implies superior intelligence and the power of attaining to the knowledge of a First Cause,—or it implies a faculty which potentially includes this knowledge :—hence the universality of human belief in a Superior Power,—and hence, if brutes could reason at all, they also would know and contemplate a First Cause—or a God !—for if they possessed the faculty *potentially*, it would be developed *actually*, as in the case of man :—hence also it follows, conversely, that if they understood human language, or any language that can properly be considered a language, they would be men in nature though beasts in form. It may thus be deduced, that what are *Moral* and *Rational* Perceptions in Man, must be merely *Natural* or *Instinctive* Perceptions in the Brute :—and it would be equally philosophical to suppose the Beaver saying to himself, “ I must build a house to live in, near the water, and lay up a store of twigs,” as to suppose the Dog to say to himself, “ I am going a hunting to-day.” In a word, if the ideas of brutes be the same in kind with those of man, they must be embodied in a tacit but real language,—a language as real as that of man himself. For it appears certain that a creature capable of regarding an external object, and of saying, or what amounts to the same, of thinking of such object—“ that is,” would also be capable of saying or thinking further respecting such object—“ that is *blue*,” or, that is *green* ;” and the forms of language thus employed in tacit thought being essential to such perceptions, their possessor must be supposed capable of affixing signs to ideas ; and hence, if gifted with the means of articulation, as some animals are, it requires no stretch of the imagination to suppose him reasoning outright ; or for example’s sake, taking up, with a slight variation in language, the theme of the disputants on the colours of the Chamæleon, and saying to a companion equally well versed in vocables—

I see it, Sir, as well as you,
And must again affirm it blue.

And upon these principles, indeed, we might yield credence to the story told by Locke, and apparently believed by Prince Maurice,

of the Parrot *who spoke Portuguese from his own proper rationality.*

It appears evident then, that a rational acquaintance with the qualities of things, supposes the being of whom it is affirmed, to be endowed with a species of thought the same as that developed audibly by articulate language; since this thought forms the basis of rational ideas. If therefore Brutes do not possess this species of thought, their conscious ideas of objects must be non-rational, and must consist of *peculiar modifications of impressions received from the senses, and differing in their nature from the ideas taken up by the human mind through the same medium.* In my first Essay I observed,—“although man possesses a lower or animal mind, similar, *as considered distinctly and by itself,* to the brute mind, and which inferior mind or region he looks down upon from an intellectual eminence, it is evident that his consciousness respecting even the things of this inferior region, is illumined by the glorious light of intellect and rationality which is proper to him.” If this be true, the converse must also be true as applied to the Brute; and hence must arise *a distinction between the nature of the Ideas and Memory of Brutes, and the Ideas and Memory of Man.* With this view, the modifications of Memory which I formerly considered as proper to Brutes, and which, as then mentioned, I found corroborated in a work by Mr. Forsyth, will be seen to accord, and also to be in harmony with the course of brute action in general; agreeing with the unconscious intelligence displayed therein, in a manner which I cannot perceive possible by adopting any system or theory which ascribes to brutes a voluntary power of thought and memory.

Mr. Forsyth observes—“By means of involuntary memory, an inferior animal may be taught to expect particular events. If the same word is repeated to a Dog every time he is fed, the sound of the word will become involuntarily associated in his memory with the pleasure of eating, and he will acquire the habit of coming to the person who pronounces this word; but he can never make use of this or of any other word himself, because he cannot voluntarily recollect or recall it to his memory. When he sees an object, he

cannot intentionally recollect its name; and when he hears the name he cannot recall the absent object: though, by the effect of association, he may feel pleasure when a name is repeated, or acquire the habit of performing certain motions in obedience to it.

“Some of the inferior animals possess organs sufficiently fitted for uttering articulate sounds; and accordingly they can easily be taught to pronounce words; but to these words they do not affix any meaning. Other animals cannot be taught to utter words, though they seem to understand many words when spoken by man. But no animal possesses the power of speaking and of understanding its own speech at the same time. The reason is this.

“Animals possess sensation, involuntary memory, and a perceptive faculty; they also possess voluntary power over their limbs and organs of sense: but the defect or inferiority of their intellectual nature consists of this,—that they possess no voluntary power over their memory, and therefore cannot intentionally recollect any thing. When they see one object, they cannot, by an act of will, arrest the train of their ideas, and call up the remembrance or idea of another that resembles it; and hence they cannot arrange or form classes of objects.”*

The Dog is evidently one of the most sagacious of brutes, often an inhabitant of our dwellings, and were he capable of a rational survey of objects, and a rational apprehension of human language, he would, thus circumstanced, acquire with the children of the family, human ideas and human knowledge. No such thing, however, takes place: he is, and ever must be, *non-rational*, in the strict and proper sense of this term; and there is no point of comparison, in the nature of affinity, between the perceptions of the most tutored animal and the earliest dawnings of rationality in the infant mind.

The Dog, it is true, has a perception, such as it is, of the meaning of the words “come here,” and of all others that are necessary to the economy of his proceedings with man; but it is surely too much to affirm him capable of the thought—“when my master

* *Principles of Moral Science*, by Robert Forsyth, Esq. Edinb. 1805. Sect. On the difference between the Human and Brute Mind.

says 'come here,' he means that I am to move from where I am, and go to the spot where he is,"—as included in the proposition, "come here"; which however would be the case were he capable of a rational understanding of these words. The perception of the animal may be accounted for from other principles, which will be adverted to as we proceed.

Let us now, for the sake of illustration, concede to Brutes a supposed power of reasoning, and a memory similar in all respects to that of Man, and endeavour to trace from these premises, what, in such cases, must be the nature of their ideas; and if it should appear, upon this mode of investigation, that these are such as cannot with propriety be ascribed to brutes, it will follow that there are grounds to conclude, that both their ideas and discrimination of objects must be different *as to consciousness* from the ideas and discriminations of Man.

Dr. Hancock does, indeed, very consistently, allow to Brutes the power of abstraction. In page 110, he observes, "Locke is not disposed to allow them the power of abstraction. It is however well observed by the writer of the article Instinct, in Rees' Cyclopædia, that 'there are many facts from which it is evident, that brutes on some occasions exhibit proofs of this faculty.' And to this opinion (says Dr. Hancock) I assent." And with this consequence I myself also agree, namely, that if they reason at all, they must reason abstractedly; or, in other words, they must possess a knowledge of the qualities of things whereon to exercise their reasoning. How, for instance, can a brute reason upon the nature of any object before him, and not be at the same time able to perceive its relations of length, breadth, thickness, or colour, with respect to other objects? and how can he reason upon a particular sound, without perceiving the relation of its key or pitch in comparison with the key or pitch of other sounds? *If he proceeds by reason*, in the formation of his knowledge, these relations are necessary to him. The merest savage is acquainted with them,—*reasonably so*,—and is capable of extending his rational knowledge upon such subjects to all the Laws of Geometry, of Light, and of Sound.

Admit that animals possess this reasoning power, and a volun-

tary memory, and let us suppose them to exercise their ideas upon *distance*,—and there is no more absurdity in this, than in the supposition that they regard from reason the relations necessary to the acts enumerated in Dr. Hancock's examples:—let them then reason upon distance,—a rational idea of which is one of the most obvious they could entertain,—and a conception of the relative distance of objects being thus supposed possible to them, the idea of *measurement* will also be possible; or a capability of attaining it will in such case exist. If we suppose them to perceive, in a rational manner, the difference between a right and a curved line, a difference which affects every object they can behold,—they would be enabled to draw from this source ideas of *form*, founded on the rational perception of such difference; this they must do if their perceptions of objects *in these respects* were rational in their nature. Hence it is evident they must, supposing them rational in any degree, or in their perceptions of the most obvious and common properties of external objects, possess a capability to attain ideas of measurement and form, *as such*, or objective ideas of measurement and form. But it would be absurd to suppose the Brute capable, in common with the savage or uncivilized man, of a knowledge of measurement, *as such*; and as this knowledge is essential to a *rational* apprehension of these qualities, it is plain the brute cannot be endowed with human rational ideas or discriminations upon these subjects, and that his ideas and discriminations must consist of modifications peculiar to him; although, if we judged from the actions of the latter, alone considered, the contrary might well be inferred.

The Brute therefore, it appears to me, has no idea of distance, measurement, or form, *as such*: and in like manner he has no idea of the difference between any two objects,—between a Yew tree and an Oak,—by any rational knowledge of them: these objects make two different impressions on him, through the organ of sight, and he may exhibit an intuitive preference, or be led by some association to prefer one of them; but he cannot rationally compare them, and therefore has no essential knowledge concerning them:—he is just in the same predicament with respect to these,

as with respect to the square and the circle. Under the influence of a particular perception or instinctive impulse, he may indeed discriminate acutely between either; but his distinctions vanish with the occasion. Thus, with respect to difference of colour, he compares not between a red object and a blue, as being either *red* or *blue*, and if he has a preference, it is instinctive; he has no notion of colour, *as such*; or, in other words, *the idea of colour does not become objective to his mind*, because this possesses no ability to recognise the differences or relations of objects, with respect to their colour,—by any proper conscious power. If Brutes are thus incapable of a *rational* apprehension of quality, their ideas must be extremely simple in their nature,—the results of a peculiar species of perception adapted to the station they are designed to fill in creation; their discriminations being exercised on such simple modes of perception, must also, as to *their* consciousness, partake of this simple character, notwithstanding they may be vivid and strong. Their impressions, though distinctly enough perceived, must be to themselves intellectually obscure, or rather, dark:—thus their idea of a man, a tree, or other objects, will differ from that of man himself, by being non-rational in its nature. No one, for instance, who carefully weighs the matter, will suppose that a Dog, who recognises his master with more precision than is evinced by a rational acquaintance, has any human idea of his master as a Man; or that he has any other than a vague perception concerning him, as of a being whom he finds himself constrained to love and obey.—And in this it is clear he is led by an influence which he can neither understand nor controul. And hence it appears—That any rational perceptions of the differences in objects must be effected by a species of acquaintance with their qualities of which brutes are incapable; and that without such acquaintance with their qualities, they can have no rational apprehension concerning the things themselves:—thus that the conscious impressions or ideas which are conceived from the action of the senses upon external objects in a being incapable of reflecting upon the qualities of such objects, must necessarily be of a nature different from the conscious im-

pressions of a rational and intelligent mind exercised upon the qualities, and determining the intrinsic relations of the objects presented to it.

The practical illustrations which I am about to offer will, I trust, place this inference in a less dubious light than that of mere hypothesis.

If then the supposed reasoning faculty in animals be incapable of regarding objectively the most obvious natural properties of external objects, much less can animals be considered capable of viewing objectively the properties or qualities of actions either in themselves or man. We are therefore led to ask—to what principle are we to refer those actions, *apparently rational*, which are performed by Brutes in their state of intercourse with Man. The answer to this question has, I trust, in some measure been anticipated, but I proceed to a specific consideration of it.

If brute creatures have, in any instance, perceptions imparted to them according to the peculiar affections of which they are made susceptible, there can be no reason why the perceptions so imparted should not be of a kind *suited to the nature of the circumstances* in one case, as well as in another; thus we are warranted in assuming that in the intercourse of brutes with man (which, by the way, appears to be regulated according to peculiar laws of permission) there can be no reason why a knowledge especially fitted to the nature of such intercourse should not be imparted as an *accommodated instinct*, through the medium of man, or otherwise,—in the present case as well as in that of the intercourse between brute and brute. An *accommodating Power in Instinct*, or a variation of Perception not ascribable to any reasoning process, is admitted;* why then, if instinctive perception varies under other circumstances, should it not vary for the purposes of intercourse between the Brute and Man? and why should we seek to superadd the Principle of Reason, as possessed by the latter? Dr. Hancock observes, that in the actions he enumerates of animals under the sphere of human influence, the elements of reason are comprehended; and we have seen that they are not less so, in the operations of direct instinct:

* Hancock on Instinct—p. 102.

nothing essentially *irrational* is to be found in the latter. The sole question is, in either case, how much of this intelligence, or whether any of it, essentially belongs to the conscious nature of the agent.

That the sphere of human beings exerts an influence of an occult and most wonderful nature on the mental constitution of animals without even any direct communication taking place between them,—thus that an influence is felt by them in consequence of their remote relations with Man, is strikingly proved by the circumstance, alluded to in a former Essay, of the young Foxes mentioned by Mons. F. Cuvier, which when cubbed in the vicinity of human abodes are known, even from the litter, and prior to all experience, to display a sharpened sagacity, compared with those which are born in wild and unfrequented regions. This affords a strong inference respecting the *nature* of human influence operating *tacitly*. After this, can we wonder that all the surprising acts of imitation which we observe in tutored animals should be effected by the same tacit agency, acting by or through the human mind more directly upon the brute,—by an instinctive impulse from whence may arise those modifications of perception and action which present us with an image of freedom and rationality in a non-rational subject.

For if brutes possess no proper objective knowledge of quality and relation, no essential power of arriving at true ideas of the nature of things or actions; how but by an influence connected with the tacit agency of Superior Intelligences, operating upon them, can we account for the moral and intellectual qualities in their actions! From what other cause can arise the exhibition of such feelings and perceptions as are indicated in the actions of animals more immediately within the sphere of human minds, while we are withheld by the entire condition of their nature, and even by appearances themselves, as well as by the absurd results that would follow the admission, from supposing these inferior beings capable of any rational contemplation of such feelings and perceptions—and, by consequence, from supposing them capable of consciously originating them in themselves.

Whence does the gorgeous War-Horse outstrip his rider in the

majestic peering of his deportment! whence does he surrender his vast powers, and adapt them so admirably for war? Surely not from any reasonable intelligence concerning them, and consequent application of them on his part: all that can be here said of him is, that he is formed to be susceptible of influences the true nature of which he is himself ignorant, and from which his actions clothe themselves, if I may so speak, with an apparent rationality.

Whence can it arise that animals in a state of domestication are capable of obeying the words addressed to them, while yet they have no essential knowledge of them,—whence but from a collateral instinctive influence received from man, and suited to affect a mental organization formed with a capacity to be so affected?—the reality of this source of instinct, wonderful as it appears, is not on that account less entitled to credit and belief than that of instinct in general, provided it can be shewn that there are sufficient grounds for admitting it: the fitness of the brute mind to receive peculiar impressions of a high order, while their degraded station indicative of a low species of consciousness, marks them to be no partakers in reality, although they are so in appearance, of those qualities which constitute Humanity; these are the circumstances that, taken in connection with the positive and manifest influence exercised by man over animals,—and without which it would be impossible for man to tame any wild animal whatever, unless the latter could be reasoned with,—form the grounds for admitting this particular source of a collateral instinct, or at least, of a modification of the general instinct by which the brute kingdom is directed.—This explains why the Dog, who has no essential knowledge of the words “come here,” nevertheless obeys them so readily;—why he understands even the looks and gestures, the smiles and frowns of his master, although he knows not what is a smile or a frown;—why his perception is positive with respect to the influence of these things upon him. As well, however, might we dignify by the name of Reason, the perceptions of the Cricket, who directs her motions by the call of her mate, as ascribe it in this case to the Dog. The perceptions of the latter are more varied and perfect in degree, but equally remote as to kind from human per-

ceptions, as respects consciousness ; and it is this which must determine all the claims of the brute to rationality.*

I proceed now to some practical examples. It is related in a communication, from M. de Tolstoy, of particulars of a Survey of the North Coast of Siberia, undertaken by Messrs. Wranguel, Anjou, and Matuchkin, that—"To cross the sea, in other words the ice, they made use of a sort of carriage, called *nartu*, drawn by 12 or 13 dogs. These animals were extremely serviceable to them, as well in defending them from the black and white bears and the wolves, as by their astonishing intelligence ; their instinct always guided them in the best track ; and when the travellers thought they had gone astray, the dogs led them again into the right course. The sagacity of the dogs was so great, that when they happened to trace a road in the form of an angle, they made a diagonal line [or took the direction of the hypotenuse instead of the sides] in returning. The travellers passed several weeks on the ice, between the sea and the land, sometimes upon enormous masses of ice, covered with thick beds of grey snow, sometimes upon small sheets, which often sank down and detached themselves from the material of congelation, so that they were carried away by the current and beaten about by the waves. On all these occasions the dogs rendered them innumerable services. In the places where the ice was thick and without danger, they ran rapidly upon the snow, barked, bit each other, and appeared indocile ; but the moment the track became dangerous, they were gentle, cautious, docile, walking frequently with the greatest precaution upon pieces of ice not more than half an inch thick, and seeming to advance by the order of the individual seated in the sledge."

In the instance above quoted it seems clear that the perception of the difference of distance between the line of the hypotenuse and that of the sides of the angular route, as also the ideas of form

* When we consider the principle which actuates the motion of the Polypus, we are led to reflect how much inferior the consciousness of the animal must really be, compared with that which it might well be conceived to possess when regarded with relation to the functions performed by its tentacula, its locomotion, &c.—a species of consciousness it must indeed have, but one, as to its importance, bearing no adequate relation to the acts it performs.

which it implies, were all purely instinctive : draw a diagram before the identical dogs who performed the journey, and they would have just as much idea of the difference of distance, or of the form thus presented to them, as if they had never exercised a preference respecting it. The other circumstances of the narration mark the presence of an intelligent influence, more or less in activity, according to the *contingent* requirements of the peculiar situation of themselves and their masters. Upon these, however, after what has been advanced, I need not stop to offer any comment.

The foregoing example, when contrasted with the following incidents, place in a most striking light the difference between Man and Brute, in the exercise by the former of the rational power on the most familiar qualities of objects. In the cases of two individuals who recovered their sight,—the first under the care of Sir Everard Home, the second under that of Mr. James Ware,—it is related of the first, that “different coloured pieces of card were separately placed before his eye, and so little had he gained in thirteen days, that he could not, *without counting their corners*, one by one, tell their shape. This he did with great facility, running his eye quickly along the outline, so that it was evident he was *still learning*, just as a child learns to read.”*—Of the second it is said, “Master W. knew and described a letter, not only as *white*, but also as *square*, because it had corners ; and an oval silver box, not only as *shining* but also as *round*, because it had not corners : he likewise knew, and called by its name, a white stone mug, on the first day he obtained his sight, distinguishing it from a bason, because it had a handle.”† Is it not to be inferred that the Brute would act thus respecting the properties of objects, if he possessed any power properly rational ? and thus that in the case of the Dogs above recited, when led to the choice of a particular line of direction, this circumstance would lay the groundwork in the animal mind, of a rational knowledge, to be improved upon, hereafter, respecting the figure and form thus thrust upon its attention ?

* Nicholson’s Phil. Jour. Vol. 28, No. 3.

† Ibid, Phil. Trans. 1801, p. 332.

An influence, and that a powerful one, certainly appears to act variously upon Brutes as a collateral or contingent Instinct; in other words, this influence appears to modify their perception and discrimination; particularly in those cases where utility is concerned;—by operating in concert with the general Instinct of their nature. Remarkable instances are not wanting to demonstrate the extent and peculiarity of the modifications thus produced; among which the following may be ranked, as curious and original—and is one which serves to exemplify the fact, that some individuals of the human race possess a greater degree of this influence over animals than others; a circumstance which throws considerable light upon the whole subject. We have already seen that a positive general influence is effected *on the nature of animals* by the mere proximity of human beings; and the instance about to be recited fairly leads to the inference that a human mind peculiarly constituted, may possess a peculiar and uncommon share in the production of such influence, and may effect by his superior power in this respect, over animals brought under his more immediate personal sphere, what another individual would fail in accomplishing. I am indebted for this anecdote to the kindness of my friend Dr. Spurgin, and I shall give it in his own words.

“ A gentleman rented a small farm in the county of Essex some years ago, where he had not resided long, before a number of Rooks came and built their nests upon the trees immediately surrounding the premises; they multiplied in the course of three or four years, so as to form a considerable Rookery, which was much prized: about this time, however, the farmer was induced to hire a larger farm, which obliged him to change his residence and forsake his Rooks; but to his great surprize and pleasure the whole Rookery manifested such an attachment towards him as led them to desert their former habitation and accompany him to his new abode, which was about three quarters of a mile off. Here they have continued to flourish, and to offer their salutations every night and morning without intermission to their kind friend and protector.

“ It may be well to add that this gentleman is strongly at-

tached to all animals whatsoever, that may come under his care ; and that he always experiences a striking return of affection, even from the least docile of them."

To the above I shall add the following anecdotes, related by Mr. Burchell, as occurring during his travels in the desert plains of Africa ; as this relation beautifully depicts the nature of Intuitive Perception, blending itself with subordinate freedom of action, in the service of Man. The Dog, which, as the author himself infers, appears to be expressly organized for the display of the wonderful actions which characterise his economy under human influence, is the subject.

"In the middle of the night I was awakened by the barking of some of our dogs, which continued for a considerable time : thinking it might be occasioned by the approach of hostile Bushmen, I arose and woke some of the people, that they might keep watch against danger ; but we should have spared ourselves the trouble, if we had not neglected to attend to the *various tones of barking* which dogs assume on different occasions ; and should have known that it was not men at which they were so much enraged. For in the morning one of the Hottentots found at some distance from our station, the remains of a Raama or Hartebeest, which had been devoured by a Lion ; and this it was which the dogs either heard or scented, although none of us were able to distinguish the slightest sound.

"A leg of this Hartebeest was brought home and broiled for breakfast. One pack of dogs consisted of about five and twenty, of various sorts and sizes. This variety, though not altogether intentional, as I was obliged to take any that could be procured, was of the greatest service on such an expedition, as I observed that some gave notice of danger in one way, and others in another. Some were more disposed to watch against men, and others against wild beasts ; some discovered an enemy by their quickness of hearing, others by that of scent ; some were useful only for their vigilance and barking ; some for speed in pursuing game ; and others for courage in holding ferocious animals at bay. So large a pack was not indeed maintained without adding greatly to our care and trouble, in supplying them with meat and water ; for

it was sometimes difficult to procure for them enough of the latter; but their services were invaluable, often contributing to our safety, and always to our ease by their constant vigilance; as we felt a confidence that no danger could approach us at night without being announced by their barking.

“No circumstance could render the value and fidelity of these animals so conspicuous and sensible, as a journey through regions which, abounding in wild beasts of almost every class, gave continual opportunities of witnessing the strong contrast in their habits, between the ferocious beasts of prey, which fly at the approach of man, and these kind, but too often injured, companions of the human race. Many times when we have been travelling over plains where those have fled the moment we appeared in sight, have I turned my eyes towards my dogs, to admire their attachment, and have felt a grateful affection towards them for preferring our society to the wild liberty of other quadrupeds. Often, in the middle of the night, when all my people have been fast asleep around the fire, have I stood to contemplate those faithful animals lying by their side, and have learned to esteem them for their social inclination to mankind. When wandering over pathless deserts, oppressed with vexation and distress at the conduct of my own men, I have turned to these, as my only friends, and felt how much inferior to them was man when actuated only by selfish views.

“The familiarity which subsists between this animal and our own race, is so common to almost every country of the globe; that any remark upon it must seem superfluous; but I cannot avoid believing that it is the universality of the fact which prevents the greater part of mankind from reflecting duly on the subject. While almost every other quadruped fears man as its most formidable enemy, here is one which regards him as his companion, and follows him as his friend. We must not mistake the nature of the case: *it is not because we train him to our use, and have made choice of him in preference to other animals; but because this particular species feels a natural desire to be useful to man, and from spontaneous impulse attaches itself to him.* Were it not so, we should see in various countries an equal familiarity

with various other quadrupeds ; according to the habits, the taste, or the caprice of different nations. But every where it is *the dog* only, which takes delight in associating with us, in sharing our abode, and is even jealous that our attention should be bestowed on him alone : it is he who knows us personally, watches for us and warns us of danger. It is impossible for the naturalist, when taking a survey of the whole animal creation, not to feel a conviction that the friendship between two creatures so different from each other, must be *the result of the laws of Nature* ; nor can the humane and feeling mind avoid the belief that kindness to those animals from which he derives continued and essential assistance, is part of his moral duty. To me, during my travels, the *horse* and the *ox* were scarcely less the objects of my admiration and gratitude ; and his patient performance of his unceasing and daily labours, strongly attached the latter to me."*

It may be inferred from these observations of Mr. Burchell, that the conduct of these animals, which he so beautifully eulogizes, must be the result of a perception effected by the society and influence of Man ; not by an engagement rational in its nature, as regards the animals, but agreeably to certain laws which render inferior beings instrumental to human intentions : thus the *Ox*, in like manner, whose utility this gentleman also alludes to, is capable of acting, under certain limitations, by intuition from human reason, and submits himself to the yoke with patient perseverance.

If, indeed, brutes carried on their intercourse with man by a really rational perception of things, it is presumable they would possess an articulate language : otherwise we must suppose them undergoing a perpetual and painful distraction, and condemned to a silence which they are gifted with the ability to appreciate, and therefore to deplore. Creatures so circumstanced, capable of thought, the same in kind with human thought, and at the same time destitute of speech ; created with rational powers, and yet deprived of the necessary external organs for making use of them, would, like *Eagles* without wings, be but half formed beings, left to grovel on the earth when they should soar

* Burchell's Travels in Africa. Vol. II. p. 244 et seq.

in the sky :—a nation of dumb-rationals,—reasoning lookers-on, presenting a mysterious anomaly in the works of Creation.

From the views here submitted, may be deduced the impossibility of any practical separation between Reason, and a conscious Intelligence of a superior order, like that of Man. We may, indeed, distinguish between them in the abstract; but we cannot separate them in the conscious nature of the creature. And this consideration, if it be founded in truth, is of itself alone sufficient to account for the perplexity which has involved the views of Philosophers, upon the subject of Instinct.

I have, in the course of these remarks, occasionally distinguished between Intelligence considered *potentially*, and *actually*; or between capability of developement, and actuality; because it may be said that the human infant does not reason: but there is in every human mind potentially the faculty which enables it to reason, whether in a state of developement or not; and if the brute is not in like manner possessed of it potentially, he can never be capable of reasoning upon any thing—all his perceptions must differ *in kind* from those of Man. What the consequences would be, if the brute possessed such a faculty, I have on a former occasion endeavoured to trace.

There is then, I conceive, an influence proceeding from the human mind, which affects a collateral contingent Instinct in the Brute, limited however in its extent and power by final causes; which collateral Instinct acting upon a mental organization fitted to receive its operation, renders the Brute, in a certain degree, the Agent of Human Rationality :—and to this collateral Instinct may be referred the whole of the phænomena of the particular class of actions we have now been considering. The truth of this conclusion is confirmed by the stationary consciousness of Brutes in the scale of Being; it is accordant with the actual phænomena, and is plainly deducible from them. It by no means militates against the known capacity in animals for education or instruction, *such as this education and instruction really is*: and finally, it is quite compatible with their improvement by means of experience :—for that the strength and perfection of the same perceptions and discriminations, when excited successively,

may continue to be improved, from whatever cause they are supposed to arise, is agreeable to the analogy of *habit* in man, and is probably governed by the same or similar laws: even the vegetable kingdom is subject to an analogous law of improvement.

It is impossible to contemplate a God without regarding Creation as a medium in which he is continually operating. Man in common with the Brute is a subject of Creation; he is therefore a continual recipient of Divine Influence, but in a mode differing, not in degree only, but in kind, as respects his conscious life. The difference between created beings does not, therefore, consist in their existing *independently*; but in the *quality and nature of their consciousness with respect to the modifications of life they continually receive*. It is in this respect that Man differs from the Brute:—not that the high powers he possesses are his own in such a sense as not to be derived momentarily from a First Cause; but that he is so constituted as to be blessed with freedom in their exercise, accompanied with such a consciousness as would arise from their being actually self-derived;—such consciousness being an essential part of his nature as a free Agent;—although a sense of dependance on a Superior Power, for every moment's exercise and possession of his endowments, is ever pressing upon his conviction:—this it is that leads him to regard himself as the subject of a higher Intelligence than what he calls his own; and to feel, while he traverses the works of Creation, that he is more immediately allied to its Author. There can be no doubt, that, in this sense, the Deity is more immediately present in the Human sphere of existence than in that of the Brute; and hence it would seem that the Divine Influence must pervade all lower modes of existence, in relative succession, or, more or less *mediately*: from which circumstance we may account for the various and beautiful analogies with which Creation is filled, and which though as yet but imperfectly recognized, continue to present themselves.

Intelligence operating in modes analogous must pervade the course of nature, giving birth to principles of Life and Motion: Nature would otherwise become a chaos.—Without it not a plant could flourish, nor a crystal be formed.—And as it must embrace *Moral and Rational* as well as *Natural Ends*, it would appear

that the difference of Created Beings must consist in the mode of their reception of this Intelligence; as modified in Principles like those of Instinct, Sensation, and Power of Organization;—and with respect to Man, as modified in the Powers of Rationality.—*Man alone appears to receive it in freedom.*

ART. XX. *Sketches in Ornithology; or Observations on the leading Affinities of some of the more extensive groups of Birds.* By N. A. VIGORS, jun. Esq. A.M. F.L.S.

[Continued from p. 70.]

ON THE GENUS ICTERUS, *Briss.*

WHEN we consider the comprehensive nature of the views by which Linnæus was guided in his arrangement of Ornithology, and the limited information that existed respecting the habits and manners of the extra-European forms which were known to his times, we ought not to feel surprise, but rather should conceive it to be the necessary result of his undertaking, were we to find that many subordinate errors had crept into his primary divisions, with regard to the affinities of the species which composed them. In an infant state of science an analogical resemblance may easily be mistaken for an indication of affinity; and many species may thus be at first sight admitted into the same group, in consequence of a partial similarity of character, which may afterwards be discovered, by the prevalence of some less conspicuous but still essential peculiarities, to occupy different stations in nature. Every day's observation, even in the present comparatively advanced state of Ornithology, convinces us of this fact. Such errors however, although we might reasonably be prepared to meet with them, are seldom observable in the works of Linnæus. So eminent was the insight of that great man into natural affinities, that, with one or two exceptions, his leading divisions have stood the test of examination; and modern science, with all its superiour advantages of experience and observation, has

been able to detect but few deviations from nature in the arrangement of those primary groups.

The most striking perhaps of these alleged deviations of Linnæus is observable in the construction of his genus *Oriolus*. That group embraces species which are now considered to exhibit two distinct types of form, and to occupy two separate stations in nature: the one, composing the genuine *Orioli* of the Old World, and the second the *Icteri* of M. Brisson or the *Cassiques* of the French Ornithologists, which belong to the New; the first of these being birds which approach most closely to the *Thrushes* by their general habits, and the construction of their bill, which is arched and dentated; the latter, birds which are equally allied to the *Stares* by their gregarious and prædacious habits, and their sharp, straight, conical and entire bills. A general resemblance which, at first sight, may be observed between the two groups, accounts for their being placed in one continuous assemblage by Linnæus. A similarity of colouring prevails throughout the species of both, so strong as to have suggested the greater part of the different names assigned to them;* a partial approximation of habits appears to bring them in contact; together with a very striking correspondence in the manner of building their nests, which are generally suspensile, and for the most part woven together with unusual ingenuity and elegance. These relations, however, between the two groups are considered by modern science to be merely analogical: while the stronger relations, which unite the true *Orioli* to the *Merulidæ*, and the *Icteri* to the *Sturnidæ*, are conceived to be those of affinity. The *Orioles* consequently have of late been placed with the *Thrushes* in M. Cuvier's tribe of *Dentirostres*, and the *Icteri* with the *Stares* in his adjoining tribe of *Conirostres*. How far the above relations of analogy that exist between the two groups may still be preserved, and how far they may still form a bond of connexion between them in the general arrangement of the order to which they belong, is a point which I have attempted to explain in some observations on the general affinities of Ornithology lately published in the *Linnean Transactions*.† And I have felt considerable satisfaction in being thus

* Such as *Oriolus*, *Icterus*, *Xanthornus*.

† Vol. XIV. p. 471.

able to reconcile the disposition of Linnæus with the modern principles of science, and thus to harmonize the partially correct, although apparently different views of naturalists, by one comprehensive mode of interpreting the laws of nature.

M. Brisson was the first who made a separation in the Linnean genus *Oriolus*, and leaving the original name to the typical species of that group, brought together the *Conirostral* birds of the New World belonging to it under the generic title of *Icterus*. An increasing number of species, and a corresponding increase in the modifications of their characters soon called for a still further subdivision of this latter group; and succeeding ornithologists have considered it necessary to separate it into several distinct genera. It is my intention in the present sketch to endeavour to ascertain the typical characters of each of these subdivisions as they have been established by modern authours, and to add two new species which have lately been brought to me from Brazil, one of which will afford me an opportunity of characterizing a hitherto unnoticed modification of form.

The whole of the group of *Icterus*, Briss., which nearly corresponds with the *Cassiques* of M. Cuvier, appears to form a fifth, and very conspicuous subdivision, of the family of *Sturnidæ*. The species are united by their manners, and by a general conformity in external characters. These characters and the station which the subfamily holds in the Class may be stated as follows.

Ordo. INSESSORES.
Tribus. CONIROSTRES. Cuv.
Fam. STURNIDÆ.
Subfam. ICTERINA.

Rostrum elongatum, acutum, conicum; *mandibulæ* superioris basi inter frontis plumas retrorsum extendente: *mandibularum* marginibus introrsum inclinantibus.

Alæ mediocres, ad caudæ medium extendentes; *remigum* 2^{dæ} ad 4^{tam} inclusam pogoniis externis medium versus emarginatis.

Pedes mediocres; *acrotarsiis* scutellatis in squamas sex divisis; *paratarsiis* integris.

Cauda mediocriſ.

Although M. Brisson united all the birds of this subfamily into one genus, he was aware of the partial differences that existed in their characters, and he distinguished his species accordingly by the trivial names of *Cassiques*, *Troupiales*, and *Carouges*. He even went so far as to designate these assemblages respectively by the more scientific appellations of *Cassicus*, *Icterus*, and *Xanthornus*. But he subjoined no distinguishing characters to the species which he thus denominated; and it is not easy to determine the limits by which he meant to circumscribe these minor groups. The task of characterizing them has been effected by later ornithologists, but M. Brisson's names, having the advantage of priority, have been with justice retained to the modern genera.

The whole of the subfamily may be observed to have a striking peculiarity in common, namely, the base of the upper mandible passing backwards to some extent on the front of the head. In some birds, however, of the group, the portion of the mandible which thus extends among the plumes of the forehead is broad and rounded: while in others it is narrowed, sharp, and angulated. This strongly marked difference induced M. Daudin to separate the former birds into a genus under M. Brisson's old name of *Cassicus*:* but he still left all the remaining birds undivided in one group under the original name of *Icterus*. His genus which will be seen to be distinguished by other characters besides the breadth and roundness of the base of the upper mandible, may be described as follows.

CASSICUS. Daud.

Rostrum crassum, rectum; *mandibulæ superioris* basi latâ, depressâ, rotundatâ: *naribus* ovalibus nudis.

Alæ subrotundatæ; *remige* 3^{tiâ} et 4^{tâ} æqualibus, longissimis; 1^{mâ} et 6^{tâ}, 2^{dâ} et 5^{tâ} ferè æqualibus.

* M. Daudin has written this word *Cacicus*, instead of adopting M. Brisson's mode of orthography. M. Illiger restores the old name with great propriety. "*Cassicus* a *maxillæ* basi, *cassidis* seu *galeæ* instar *frontem* tegente, vocatus est: hinc *Cacicus* falso scribitur." *Prod. Mam. et Av.* p. 214.

Cauda præcipuè subæqualis.

Pedes fortes.

The following species, which consist of some of the largest and most powerful birds of the subfamily, may be selected as the representatives of this genus.

* *Caudâ ferè æquali.*

Oriolus niger. *Gmel. Syst. I. p. 393. sp. 45. Cacique noir. Daud. Tom. II. p. 329. sp. VI. Troupiale noir. Pl. Enl. 534. Briss. Tom. II. p. 103. sp. 15. t. 10. f. 1. Black Oriole. Arct. Zool. Vol. II. p. 259. sp. 144.*

Oriolus Persicus. *Linn. Syst. Vol. I. p. 161. sp. 7. Le Cassique jaune. Briss. Tom. II. p. 100. sp. 14. t. 9. f. 1. Pl. Enl. 184. Jupujuba. Will. Orn. pl. 23. Black and Yellow Daw of Brasil. Edw. t. 319. Cacique cul-jaune ou Yapou. Daud. Tom. II. p. 327. sp. 3. pl. XXV.*

Oriolus hæmorrhous. *Linn. Syst. Vol. I. p. 161. sp. 6. Le Cassique rouge. Bris. Tom. II. p. 98. sp. 13. t. 8. f. 2. Pl. Enl. 482. Cacique cul-rouge. Daud. Tom. II. p. 328. sp. IV.*

** *Caudâ rotundatâ.*

Oriolus cristatus. *Gmel. Syst. 1. p. 387. sp. 33. Xanthornus maximus. Pall. Spic. Fasc. VI. p. 3. t. 1. Cassique huppé de Cayenne. Pl. Enl. 344. ♂ Cassique vert de Cayenne. Pl. Enl. 328.*

This last species has the tail more graduated than the other species of the genus, in which respect it evinces an approach to the succeeding groups which now come before us, in which the lateral tail feathers are much shorter than the middle.

The second portion of M. Brisson's *Icteri*, or those which have the base of the upper mandible narrow and angulated, and which compose M. Daudin's genus *Icterus*, are again diviseable into two departments which M. Cuvier has formed into genera.* In

* It appears to me that we must altogether reject the names which M. Vieillot has assigned to the genera into which he has separated the *Icterus* of M. Daudin. In these genera he has merely adopted the divisions which M. Brisson has in some measure pointed out, by the trivial titles of *Carouges*,

one of these departments the bill is somewhat arched ; in the second it is perfectly straight. To the former M. Cuvier retains the original name of *Icterus* ; while for the latter he has revived the old title of *Xanthornus*. He has added however to his genus *Icterus* some species of the Linnean *Gracula*, which though nearly allied to his *Icteri* by their general habits and characters, are yet distinguishable from them by the strength of their bills and the boatlike structure of their tails. These birds M. Vieillot had previously formed into a genus by the name of *Quiscalus*. They seem to be intermediate between *Cassicus* and M. Cuvier's *Icterus* ; being allied to the former by the strength of their bills, and approaching the latter by the curvature of those members and the angulated base of the upper mandible. They differ from the whole subfamily by the singular form of their tail, which has a square or rather angular apex, instead of an even or rounded one, and which is capable of being laterally compressed, so as to bear a keel-like appearance. They may be characterized as follows.

QUISCALUS. Vieill.

Rostrum forte, subcurvatum, culmine convexo : mandibulæ superioris basi angusto, angulato ; naribus ovalibus partim membrano tectis.

Alæ subrotundatæ ; 1^{ma} et 5^{ta} remige æqualibus, 2^{da}, 3^{ta} et 4^{ta} ferè æqualibus longissimis.

Cauda gradata, apice angulata, lateraliter complicabilis, cymbiformis.

Pedes fortes.

The following Linnean birds form the typical species of this genus.

Baltinores, and *Troupiales*, to which he himself assigns the names respectively of *Pendulinus*, *Yphantès*, and *Agelaius*, without any reference to the original scientific names which M. Brisson gave to the same groups, and which M. Cuvier afterwards restored. It sometimes occurs that M. Vieillot exhibits too much haste in giving names of his own to groups which have already been distinguished by established and popular titles. But we owe too much to that gentleman's labours in Ornithology, not to be willing to pass over a few inaccuracies, and few they certainly are, of so minour a nature.

Gracula quiscula. *Linn. Syst.* Vol. I. p. 165. sp. 7. *Pica Jamaicensis*. *Briss.* Tom. II. p. 41. sp. 3. Purple Grackle. *Arct. Zool.* Vol. II. p. 263. N°. 153. *Lath. Syn.* Vol. II. p. 462. sp. 6.—Vol. III. p. 174. sp. 35. Ed. 2^{da}. *Wils. Am. Orn.* Vol. III. p. 44. pl. 21. f. 4.

Gracula barita. *Linn. Syst.* Vol. I. p. 165. sp. 4. *Sloane Jam.* p. 299. t. 257. f. 2. Boat-tailed Grackle. *Arct. Zool.* Vol. II. p. 264. No. 154. *Lath. Gen. Syn.* Vol. II. p. 460. sp. 5. t. 18.—Vol. III. p. 179. sp. 33. pl. XLIV.

The species that remain of M. Cuvier's *Icterus* are distinguished by a somewhat slender and arched bill, and a graduated tail: in both of these latter particulars approaching the preceding genus *Quiscalus* more closely than any other group of the subfamily. The following appear to be their characters.

ICTERUS. Cuvier.

Rostrum subgracile, subelongatum, subarcuatum; *naribus* ovalibus partim membrano tectis.

Alæ subrotundatæ: remigibus 2^{da}, 3^{ta}, 4^{ta}, et 5^{ta} ferè æqualibus longissimis.

Cauda gradata, rotundata.

Pedes subfortes.

The following birds may be selected as the typical species of this genus, and those of the most common occurrence.

Oriolus Bonana. *Linn. Syst.* Vol. I. p. 162. sp. 12. Le Carouge. *Briss.* Tom. II. p. 115. sp. 22. t. 12. f. 2. *Pl. Enl.* 535. f. 1. *Icterus minor nidum suspendens*. *Sloane Jam.* p. 229. sp. 16. t. 257. f. 1. Bonana Oriole. *Lath. Syn.* Vol. II. p. 436. sp. 22.

Oriolus chrysocephalus. *Linn. Syst.* Vol. I. p. 164. sp. 20. Le Carouge a teste jaune d'Amerique. *Briss. Sup.* p. 38. sp. 32. t. 2. f. 2. Gold-headed Oriole, *Lath. Syn.* Vol. II. p. 442. sp. 32.

Oriolus Cayanensis. *Linn. Syst.* Vol. I. p. 163. sp. 15. Le Carouge de Cayenne. *Briss.* Vol. II. p. 123. sp. 26. t. 9. f. 2.

Carouge de l'isle St. Thomas. *Pl. Enl.* 535. f. 2. Yellow-winged Pye. *Edw.* t. 322.

The remaining species of M. Daudin's *Icteri*, which M. Cuvier has characterized as his genus *Xanthornus*, although closely allied to the group which we have quitted, are separated from it by their straighter bills. The margin of the mandibles also is angulated near the gape, while in the genuine *Icteri* it forms an uninterrupted curve. Their tails again are less graduated than those of the *Icteri*, and in some instances may be observed to be nearly equal. The genus appears to be thus characterized.

XANTHORNUS. Cuv.

Rostrum subgracile, rectum, acutissimum : mandibularum marginæ basin versus angulum formante : naribus ovalibus membrano partim tectis.

Alæ subrotundatæ : remige 1^{mæ} et 6^{tæ}, 2^{dæ} et 5^{tæ}, 3^{tiæ} et 4^{tæ} ferè æqualibus, his longissimis.

Cauda subæqualis.

Pedes subgraciles.

In this genus may be included the following well-known species, which appear to exhibit the typical characters of the group.

Oriolus Mexicanus. *Linn. Syst.* Vol. I. p. 162. sp. 13. *Oriolus Xanthornus.* *Gmel. Syst.* Vol. 1. p. 391. sp. 13. Le Carouge de Mexique. *Briss.* Tom. II. p. 118. sp. 23. pl. 12. f. 2. *Pl. Enl.* 5. f. 1. Lesser Bonana Bird. *Edw.* t. 243. *Shaw. Nat. Misc.* pl. 243.

Oriolus icterocephalus. *Linn. Syst.* Vol. I. p. 163. sp. 16. Le Carouge a teste jaune de Cayenne. *Briss.* Tom. II. p. 124. sp. 27. pl. 12. f. 4. Carouge de Cayenne. *Pl. Enl.* 343. Yellow-headed Starling. *Edw.* t. 323.

Oriolus Baltimore. *Linn. Syst.* Vol. I. p. 162. sp. 10. Le Baltimore. *Briss.* Tom. II. p. 109. sp. 19. pl. 12. f. 1. *Pl. Enl.* 506. f. 1. Baltimore Bird. *Arct. Zool.* Vol. II.

p. 257. t. 12. *Cat. Car.* 1. t. 48. *Wils. Am. Orn.* Vol. I. p. 23. pl. 1. f. 3. pl. 53. f. 4.

Oriolus minor. *Gmel. Syst.* Vol. I. p. 394. sp. 46. Lesser Black Oriole. *Lath. Gen. Syn.* Vol. II. p. 446. sp. 38.

Oriolus varius. *Gmel. Syst.* Vol. I. p. 390. sp. 38. Le Carouge de Cayenne. *Pl. Enl.* 607. f. 1. Bastard Baltimore. fem. *Cat. Car.* Vol. I. t. 49. f. inf. Chesnut and black oriole. *Lath. Gen. Syn.* Vol. II. p. 437. sp. 24.—Vol. III. p. 119. sp. Ed. 2^{da}. *Oriolus mutatus*, or Orchard Oriole. *Wils. Am. Orn.* Vol. I. p. 64. pl. 4. f. 1, 2, 3, 4.

The latter species seems to stand at the extremity of this group where it joins *Icterus*; the bill being slightly curved, and the tail somewhat more graduated than in the adjoining species.

The following bird, which I do not find any where described, may be added to the typical species of this genus.

CHRYSOPTERUS. *X. niger*, capite subcristato, ptilis uropygioque flavis.

Tab. Sup. 9.

Capitis frontis verticisque plumæ paululum elongatæ, cristam parvam formantes. *Remiges rectricesque* subtus subfuscæ. *Rostrium* pallidum. *Pedes* nigri. *Longitudo corporis*, $6\frac{1}{2}$; *alæ* a carpo ad remigem 3^{tiam}, 4; *caudæ*, $3\frac{1}{2}$; *tarsi*, $1\frac{1}{8}$; *rostri* ad frontem, $\frac{1}{10}$.

Habitat in Brasiliâ.

From the foregoing genus *Xanthornus*, as it was defined by M. Cuvier, another type of form may still be separated. All his *Xanthorni* possess a straight and conical bill, the margin of the lower mandible of which forms an angle, as has been observed, near the gape. But in some species of the group thus distinguished, the bill is much stronger than in the others, and possesses considerably more breadth and depth at the base. In this respect the species to which I allude stand intermediate between *Xanthornus* and *Cassicus*, the first group which I particularized in the subfamily. They are equally distinguished from *Xanthornus* by the structure of their wings, of which the first four tail

feathers are nearly of an equal length; and by their tail being in general even. A singular peculiarity is also observable in the same member; the shafts of the feathers being for the most part prolonged beyond the webs, and the webs themselves being pointed instead of being rounded as in the other groups of the subfamily. Their *tarsi* again evince a considerable decrease of strength. All these characters present indications of a different mode of life, and a different station in nature; and they require that the species in which they are found should be pointed out by a separate name. I shall group these species together by the following characters under the generick name of

LEISTES.

Rostrum crassum, rectum, basi altum, mandibulæ inferioris margine angulato; naribus rotundatis membrano partim tectis.

Alæ; remigibus 4th extimis ferè æqualibus longissimis.

Cauda æqualis, rectricum apice angulato, rhachibus plerumque prolongatis, nudis.

Pedes mediocres, tarsis gracilibus.

The following birds may be referred to this group, the *Oriolus Americanus*, Gmel. being taken as the type.

Oriolus phæniceus. *Linn. Syst.* Vol. I. p. 161. sp. 5. *Icterus pterophæniceus*. *Briss. Orn.* Tom. I. p. 97. sp. 12. Le Commandeur. *Buff. Ois.* Tom. III. p. 214. Le Troupiale à ailes rouges. *Pl. Enl.* 402. Red winged Starling. *Cat. Car.* Vol. I. t. 13. *Alb.* Vol. I. t. 38. *Sturnus prædatorius*. *Wils. Am. Orn.* Vol. 4. p. 30. pl. 30. f. 1, 2.

Oriolus Americanus. *Gmel. Syst.* Vol. I. p. 386. sp. 29. Troupiale de Cayenne. *Pl. Enl.* 236. f. 2. Red breasted Oriole. *Lath. Gen. Syn.* Vol. II. p. 430. sp. 14.—Vol. III. p. 129. sp. 43. Ed. 2^a.

Fam.

Oriolus Guianensis. *Linn. Syst.* Vol. I. p. 162. sp. 9. *Icterus Guianensis*, *Briss. Orn.* Tom. II. p. 107. sp. 18. t. 11. f. 2. Troupiale de la Guiane, *Pl. Enl.* 536.

The following bird which has been lately brought to this country.

from Brazil, may be also added to the typical species of this genus; evincing however a slight deviation from them in the length of the bill.

SUCHII. *L. olivaceo-brunneus*; *pectore abdomine ptilis tectricibus inferioribus uropygioque flavis, rostro paululum elongato.*

Tab. Sup. 10.

Rostrum pedesque nigri. *Remiges rectricesque* subtus fuscæ. *Crissi* plumæ olivaceo-brunnæ flavo-marginatæ. *Longitudo corporis*, $9\frac{1}{10}$; *rostri* ad frontem, $1\frac{3}{10}$, ad rictum, $1\frac{7}{10}$; *alæ* a carpo ad remigem 1^{ma} $4\frac{1}{2}$; *caudæ*, $3\frac{1}{10}$; *tarsi*, $1\frac{1}{10}$.

Habitat in Brasiliâ.

Amici mei Georgii Such, Medicinæ Doctoris, Societatis Linneanæ Socii, scientiæ Ornithologicæ studiossimi, hæc species, inter complures alias adhuc ineditas, a se in Brasiliâ detecta, nomine distinguatur.

There are several other species which have been hitherto indiscriminately scattered in different genera of the Linnean system, which by their habits and manners, and a general conformity in external character, are closely allied to the present group, if not at once referable to it.* Among these are the following birds which accord with the essential characters of *Leistes*, although in some minute points they evince a partial deviation from the typical species. Their bills are in a slight degree shorter, and seem to approach more closely to those of the *Emberizæ* and *Fringillæ*; and their wings partially differ in structure, the first quill feather being somewhat shorter than the second. They appear to form the extreme groups of the present family of *Sturnidæ*, and to unite it with the neighbouring *Fringillidæ*.

* The genus *Ploceus* of M. Cuvier is intimately allied also to the genus *Leistes*, and most probably will be found to come into the present subfamily among those birds which exhibit the same modification of form as that genus. But the characters of *Ploceus* unite it also so closely to some of the *Fringillidæ*, that I cannot say whether it may not belong to that family, and be the bond of connection between it and the present group of *Sturnidæ*. I shall only therefore at present refer to the affinity between these two genera.

Tanagra Bonariensis. *Gmel. Syst.* 1. p. 898. sp. 38. Le Taugavio. *Pl. Enl.* 710. Violet Tanager. *Lath. Gen. Syn.* Vol. III. p. 222. sp. 9.—Vol. VI. p. 29. sp. 34. Ed. 2^{de}.

Fringilla pecoris. *Gmel. Syst.* Vol. I. p. 910. sp. 52. *Lath. Ind. Orn.* p. 443. sp. 28. *Emberiza pecoris*. *Wils. Am. Orn.* Vol. II. p. 145. pl. 18. f. 1, 2, 3. Le Pinson de Virginie. *Briss. Orn.* Tom. III. p. 165. sp. 41. Le Brunet. *Buff.* Tom. IV. p. 138. Troupiale de la Caroline. *Pl. Enl.* 606. f. 1. Cowpen Bird. *Cat. Car.* Vol. I. pl. 34. Cowpen Finch. *Lath.* Vol. III. p. 269. sp. 24.

Emberiza oryzivora. *Linn. Syst.* Vol. I. p. 311. sp. 16. *Lath. Ind. Orn.* p. 408. sp. 30. *Wils. Am. Orn.* Vol. II. p. 48 pl. 12. f. 1, 2. L'Ortolan de La Caroline. *Briss.* Tom. III. pl. 15. f. 3. L'Agripenne, ou l'Ortolan de riz. *Buff.* Tom. VII. p. 357. Ortolan de la Caroline. *Pl. Enl.* 388. f. 1. Rice Bunting. *Cat. Car.* Vol. I. t. 14. Reed Bird. *Edw.* t. 291. f. sup.

This last bird has a peculiarity in the shafts of its tail feathers, which, being stronger than usual, and prolonged beyond the webs, seem to carry to the extreme a character which is observable in some of the species of *Leistes*. The birds of this species use their tails * after the manner of the *Woodpeckers*, in assisting

* See WILSON. *Am. Orn.* Vol. II. p. 54. There is a species which has been described by Gmelin, under the name of *Oriolus caudacutus*, [*Syst.* Vol. I. p. 394. sp. 49.] and figured by Dr. Latham as the *Sharp-tailed Oriole*, [*Gen. Syn.* Vol. II. pl. 17.] which from the description and figure given of it appears at first sight to be nearly connected with the *Emberiza oryzivora*, and to be referable to the same group. But this species proves on more intimate knowledge to be the *Fringilla caudacuta*, or *Sharp-tailed Finch*, of the "American Ornithology," and to occupy a very distinct station among the *Corostres*, in the family of *Fringillidæ*; where in conjunction with another species described in the same work, the *Fringilla maritima*, Wils., it offers very distinguishing generic peculiarities, both in its habits and external characters. The relation however between the *Emberiza oryzivora*, Linn., and these last mentioned birds is strongly analogical; as may be seen by a reference to Mr. Wilson's account of the climbing manners of these birds. [See *Am. Orn.* ubi sup. and Vol. IV. pp. 68. 70.] I take this opportunity of observing that there are many other species referred by systematick writers to the Linnean genus *Oriolus*, which neither accord with the true *Orioles*, nor with the *Icteri* of M. Brisson which

them when climbing up the stalks of the rice and other plants, from which they derive a great portion of their food. And it is more than probable that the conterminous species of *Leister*, which possess somewhat of a similar construction of tail, employ that member to a similar purpose, though perhaps less frequently and to less extent. This striking character added to that of the shortness and encreased strength of their bills, seems to indicate their being more granivorous than the birds of the other subdivisions of the present subfamily. There is a general conformity in the habits and mode of feeding of all the groups contained in the present sketch, as also it may be added among the *Sturnidæ* in general. But many minute differences will be found, I am convinced, to exist among them, when their habits become more intimately enquired into; many of which indeed have already been partially noticed. These differences, I feel equal conviction, will be found to correspond with the differences in their external characters, as pointed out in the foregoing observations.

There are a considerable number of species belonging to the present subfamily, which have been described by different writers, and many of them even figured, but which I refrain at present from referring to any of the above subdivisions of this group. The birds themselves are not within the reach of examination; and as the descriptions given of them are chiefly confined to the specifick marks of colour and size, little knowledge can be attained respecting the important characters which are necessary, in the present state of science, to ascertain the exact station of each. Even the figures generally given of birds afford but slight assistance in these particulars. Little attention has hitherto been paid to the minuter points of structure; and even in that valuable work, the "*Planches Enluminées*," great inaccuracy has crept

have been separated from them. Among these may be mentioned some species of the Old World, such as *O. textor*, Gmel. *O. Capensis*, Gmel., &c. which belong to M. Cuvier's genus *Ploceus*; the *Oriolus leucopterus*, Gmel., figured in the "*General Synopsis*," [Vol. II. t. in tit.] which is allied to the group of *Tanagers*, and at present forms the type of M. Vieillot's genus *Tachyphonus*; the *Oriolus Picus*, Gmel. or *climbing Oriole* of Dr. Latham, [Gen. Syn. Vol. II. p. 453. sp. 45.] which belongs to the family of *Certhiidae* and to the genus *Dendrocotaptès*, Illig., &c. &c.

into the details of many of the subjects represented in it, with respect to the characters of the bill, legs, wings, &c.; so much so as to have caused numerous errors on the part of those systematic writers who have trusted to the plates only of the birds as guides to their arrangement. I have moreover to add that I have at present before me specimens of some birds, the plumage of which is wholly black, and which evidently belong to the latter groups of the subfamily before us. These for similar considerations to those stated above, I equally refrain from referring to their respective stations. Where the colouring only of birds is described, and that colouring as in the present case, is common to many birds, it is impossible to determine with accuracy, or without much labour, what bird is alluded to in such descriptions. The characters of "*atra nitens, dorso subviolaceo,*" or "*atro-violacea, alis caudâque viridi-nitentibus,*" will apply with equal precision to twenty birds, differing not merely as species, but by strong generic peculiarities. Fearing therefore I should only add to the number of the synonyms of these birds, or encrease the confusion already existing among them, were I to attempt to describe them myself, or to refer them to descriptions already given, I shall pass them over in the present sketch, which is merely intended to point out the different modifications of form exhibited in the genus *Icterus*, Briss., and the typical representatives of each. I hope hereafter to complete the group.

On looking back then to the different groups which have come before us, we may perceive that the present subfamily *Icterina* embraces five prominent types of form, which, although sufficiently distinct, are yet found to pass into each other, and to exhibit a series of affinities returning into itself. Beginning with the genus *Cassicus*, we may perceive that it is separated from the remaining groups by the rounded base of the bill as it passes backwards over the front of the head; and yet that it accords with the succeeding genus *Quiscalus*, by the strength of the same bill, by the structure of the wings, and the encreasing graduation of the tail exhibited in some of its extreme species, more particularly in the *Cassicus cristatus*. The group of *Quiscalus* again shows a deviation from the preceding group in the partial curvature of the bill,

and from those which succeed by the strength of that member; while it differs from all in the keel-like construction of the tail. By the curvature of the bill it accords with the succeeding genus *Icterus*, a group also which of all the subfamily most nearly approaches it in the lengthened and graduated form of the tail. The strength of the bill is now lost in the groups on which we next enter, and the weakness of that member becomes the predominant character. This character is conspicuous in *Icterus*, and is carried on to the following group of *Xanthornus*, uniting the two genera together, and distinguishing them from all the others. The curvature of the bill however which united *Quiscalus* with *Icterus*, is lost in *Xanthornus*, where the straight bill is again resumed. The lengthened and graduated tail of *Icterus* is also superseded by the slightly rounded tail of *Xanthornus*. The straightness of the bill now predominates, and unites this last mentioned group to *Leistes*: while the tail also slightly rounded in *Xanthornus* accords with the nearly even tail of *Leistes*. In the latter genus however the bill again becomes strong: and a different construction of the wing separates the group from the rest of the subfamily, the four first quill feathers being the longest, and all nearly of equal length. The strength and straightness of the bill of *Leistes* in the last place brings us round again to the group of *Cassicus*, which, as has been already observed, exhibits a sufficiently distinct peculiarity of character in the rounded form of the base of the bill. The typical species of *Cassicus* also differ from those of *Leistes* in the shape of the wing. But an extreme species of *Cassicus*, the *C. niger*, intimately according with the type of its own group in every other particular, deviates from it in this latter character, and assumes the wing of *Leistes*, the four first quill feathers being nearly even in length, and longer than the rest. A beautiful interchange and gradation of character is thus conspicuous throughout the subfamily; where the typical species of each group exhibit a decided difference in character, and yet where the extreme species of all approach so closely to each other, as scarcely to admit of our drawing a line of demarcation between them.

I have not as yet had sufficient leisure or opportunity to exa-

mine in detail the remaining subfamilies of the *Sturnidæ*, which seem, as far at least as my present views extend, to be represented by the genera *Pastor*, Temm., *Lamprotornis*, Temm., *Buphaga*, Briss. and *Sturnis*, Auct. I cannot therefore say with accuracy what are the normal and aberrant groups of the present subfamily. Such groups can never be decidedly recognised in any assemblage of natural objects until the characters of the adjoining assemblages are equally determined. The characters of all must be compared together in order to decide which of the groups in the assemblage under consideration are most distinguished from the adjoining assemblages, or in other words which are most *normal* in their own; and which of them on the other hand most nearly approach the same neighbouring assemblages, or, scientifically speaking, which are most *aberrant*. I shall draw out however the following table of the groups which have come before us in the present sketch, in order to point out at one view the mode in which their characters vary, and yet pass gradually into each other. And at the same time I shall suggest, although with a mark of doubt, the normal and aberrant sub-divisions; the predominant characters of the present subfamily appearing to me, as far as I can judge from a primary view of the group, to consist in the strength, straightness, and conical form of the bill, as exhibited in *Leistes* and *Cassicus*; while the character of the base of the bill passing backwards over the front of the head, being carried apparently to the extreme in *Cassicus*, seems to point out that genus as the most normal or typical of all.

Normal group?	{ Rostro recto, basi angulato. Caudâ ferè æquali.	LEISTES.
Rostro crasso, recto.	{ Rostro recto, basi rotundato, Caudâ subæquali.	CASSICUS.
Aberrant group?	{ Rostro crasso, curvato, basi angulato. Caudâ gradatâ, cymbiformi.	QUISCALUS,
Rostro aut crasso at cur- vato, aut debili.	{ Rostro curvato, debili, basi angulato. Caudâ gradatâ, rotundatâ.	ICTERUS.
	{ Rostro debili, recto, basi an- gulato. Caudâ subrotundatâ.	XANTHORINUS.

[To be continued.]

ART. XXI. *Some account of two new Species of Shells from the Mauritius.* By W. J. BRODERIP, Esq. F.L.S. &c.

WE are living at a period, when a new impulse seems to be given to the whole range of science and art; not only in the abstract, but also in their application to the wants, the comforts, and the luxuries of life. Inventions, many of which will immortalize their authors as the benefactors of mankind, rise upon us with unprecedented rapidity; and natural history lends its light to the schemes of the capitalist as well as to the views of the philosopher. Companies are formed for ransacking the mines of distant regions, nor does the spirit which has been spreading itself over the land, stop there; for it has already invaded the sea. Whether the *Meleagrina* of the Gulf of Mexico and the Bay of Panama will produce such beautiful pearls as the *Meleagrina* of the Persian Gulf and the coasts of Ceylon, is a problem which will be soon solved. An examination of the bivalve of the west and its pearls, leads one to fear, that, however great their quantity may be, the average quality will be inferior to that of the produce of the Oriental shell: and it may be, perhaps, matter of surprise among those acquainted with the marine zoology of the respective countries, that, in this age of speculation, British capital and British machinery have not yet found their way to the well stored seas of the East, where Pearls of princely size and beauty are painfully fished up by the naked diver, under all the horrors of encountering the deadly ground shark.

I have been led to advert to this line of speculation, because in many of the seas where pearls are found, the most costly shells occur; and those who would be at the pains of using their opportunity for collecting them, would find that the labour of their search, if directed by competent knowledge, would not be ill rewarded even in a pecuniary point of view, more especially if they would take particular care not to break or *clean* the shells, and would also preserve a few of each species, with the animals, in spirits.

In the Mauritius, it is the amusement of the place to watch over the trim apparatus of lines hung over some sand-bank to tempt the various brilliant species of *Oliva* which there abound, or to wait for the more rare approach of the Harp Shell, till the rich hues of its inhabitant are seen glowing through the clear blue water, in the rays of a Tropical rising sun.*

Many boxes, the produce of no very long residence at the island, have of late been sold at high prices; and, although there has been no want of fishing there, two new species, hitherto unpublished, (unless one of them has been confounded by Lamarck with his *Ranella crumena*) have lately come to my hands.

I proceed to describe these shells, and hope that the fishers of the Mauritius will proceed to still further discoveries.

RANELLA FOLIATA. Foliated Frog.

R. testâ ovato-conicâ, ventricosâ, transversim subgranuloso-sulcatâ, interstitiis longitudinaliter striatis, albente vel sub-roseâ; anfractibus tuberculorum acutiusculorum (mediis longissimis) serie unico armatis; anfractûs basalis sulcis cæteris hinc et hinc obsoletè tuberculatis; labio columellari expanso, foliato; labiis

* My friend Lieutenant Harford, who was some time on the island, and who brought home some very fine Mauritian shells, informed me that the fishery for Olives (*Oliva*, Lam. *Voluta oliva*, etc., Lin.) is carried on by means of a line running parallel with the bottom of the sea, to which line small nooses, each containing a piece of the arms of a cuttle fish (*Septa*) are appended, so that the bait touches the bottom. To one end of the principal line a chain-shot is attached by way of mooring: over this is a buoy and a flag. The other end of the principal line swings with the tide, and this end is marked also by a buoy, surmounted by a small flag. The fishery is carried on in very deep water over sand-banks, and the best times are morning and evening. The apparatus is occasionally drawn up with caution, and the Olives, which are found adhering to the bait, taken into the boat. My friend also informed me that the animal of the Harp-shell (*Harpa*, Lam. *Buccinum Harpa*, &c. Lin.) is of a rich vermillion red. The Harps are taken on sand-banks with a small rake to which a net is attached, when it is low water, at night and at sun-rise; and he conjectured that they were, at those times, out upon their feed. They have, as he said, been known to take the bait laid for the Olives.

exterioris margine expanso, tenui; aperturâ ovatâ, valde sulcatâ, aurantiacâ, supernè in sinu alto, foliato, varicem pratercunte desinente.

Habitat in Mauritio?

Mus. Farquhar. Goodall. Nest.

Icon. Tab. Supp. XI. fig. 1.

Shell ovate-conical, ventricose, not compressed, of a flesh or pale rose colour; with frequent, transverse, subgranulated, low ridges, the interstices between which are longitudinally striated; the whorls armed with one row of sharp tubercles, the middle of which are the longest, the other ridges of the body whorl obsoletely tuberculated here and there; the columellar lip expansive and foliated, and the margin of the outer lip expanded and thin; the aperture ovate, very strongly and thickly furrowed, of a rich orange colour, and terminating above in a deep foliated sinus, which extends beyond the varix.

I have been more than usually minute in giving the specific character of this shell, in order to shew upon a comparison with Lamarck's description of *Ranella crumena*, that the latter is a totally different species. The *Ranella crumena* is thus described in the Syst. des animaux sans vertebres, vol. 7, p. 151, No. 5.

“Ranelle grenouille. *Ranella crumena*.

R. testâ ovato-acutâ, ventricosâ, tuberculato-muricatâ, transversè sulcatâ aut striato-granulosâ, albido-rufescente; tuberculis longiusculis acutis, fusco maculatis; aperturâ aurantio-rubrá, albo-sulcatâ.

Murex rana. Lin. Gmel. p. 3531. No. 23.

Lister, Conch. t. 995. f. 58.

Bonanni, Recr. 3. f. 182.

Rumph. Mus. t. 24. f. G.

Petiv. Gaz. t. 100. f. 12. et Amb. t. 11. f. 15.

Gualt. Test. t. 49. f. L.

Seba, Mus. 3. t. 60. f. 13. et 15—18.

Knorr, Vergn. 2. t. 13. f. 6. 7.

Favanne, Conch. 4. t. 133. f. 1270. 1271.

Ranella crumena. Encyclop. pl. 412. f. 3.

Habite les mers de l'Inde. Mon cabinet. Le dernier tour a trois rangées de tubercules pointus; les autres n'en ont qu'une. Longueur, 3 pouces. Vulg. la bourse."

Now there would be no doubt as to this being the description of the common *Frog* or *Murex rana*, Lin.,* were it not for the account of the aperture "aperturâ aurantio-rubrà, albo sulcatâ;" and I certainly have never seen a specimen of that shell, the aperture of which justified the epithet of "orange-red furrowed with white." On the contrary, all the specimens which I have seen (and there is more than one variety) have been extremely pallid in the aperture, which is almost entirely white, with a few dashes of pale yellow or chesnut about the borders, and sometimes without any. Lamarck's description of the aperture seems, however, to have weighed with Mr. Sowerby, who has named the specimen which was in the Tankerville collection, *R. crumena*, and the description certainly is very strong.

On the other hand, we must recollect that Lamarck's *R. crumena* is the *Murex rana*, Lin.; and, on referring to the figures, we shall find that there is not one which can be well mistaken for *R. foliata*. If we strike out Lamarck's description of the aperture, nothing will remain to designate any other shell than the common *Frog*, or, as he says, "vulg. la bourse;" and, when we remember the painful visitation which compelled this great man to use the eyes of others, we may cease to wonder at so highly coloured a description. *Ranella crumena* is a very common shell and is widely spread over the Indian seas. *Ranella foliata* is very scarce, and the only specimens which have come to my knowledge (with the exception of that in the Tankerville collection, which I am unable to trace) have been undoubtedly received from the Mauritius, which place I have little hesitation in giving as its locality. The finest of those known in England, is, I am told, in the cabinet of Lady Farquhar, the Tankerville shell is in the extensive cabinet of the Provost of Eton, one was sold a short time ago by Mr. Thomas, in King-street, and I have heard from Mr. Gray that there is a specimen with the foliations much injured, in the collection of Mr. Sowerby at Lambeth. *R. foliata*, like many

* Tab. Supp. XI. fig. 2.

other species of the genus, varies much in size: the general length is about $2\frac{1}{2}$ or 3 inches, but Lady Farquhar's shell is much larger.

R. foliata appears to approach the genus *Triton* very nearly; and I cannot help thinking that a comparative examination of our shell with the shells of that genus, will lead us to place *Triton* next to *Ranella*, instead of separating them from each other by the genus *Murex*, Lam., as is now done in the *Système des animaux sans vertèbres*.

MUREX SAXICOLA.

M. testâ ovato-globosâ, angulatâ, transversim striatâ, octofariam frondosâ, fuscâ, fasciis 2 niveis interruptâ; anfractûs basalis frondibus frequentibus, laciniatis, canaliculatis, recurvis, primis penultimisque longissimis; spirâ brevi, conicâ, pallidiori; fauce albâ; dente labiali mediocri; umbilico aperto; rostro mediocri, sub-recurvo.

Var. *Septemfariam frondosâ, anfractu basali fusco.*

Habitat in Mauritio.

Mus. Nost.

Icon. Tab. Supp. XI. fig. 3.—An Martini tab. 107. f. 1006. malè?

Shell ovate-globose, very much angulated on the shoulder of the body whorl, transversely striated, and ridged with eight longitudinal rows of foliations; the body whorl chesnut brown, interrupted by two snow-white bands, and its foliations, (of which the first on the angle of the body whorl, and those towards the canal or beak, are the longest) frequent, lacinated, canaliculated, and recurved; the spire short, conical, and paler in colour; the aperture white; labial tooth moderate; umbilicus open; canal or beak moderate, recurved.

Var. with seven rows of foliations, and the body whorl entirely brown, except towards the suture, where it is white.

Length $3\frac{1}{2}$ inches.

These beautiful *Murices* were, as I am informed, found at the Mauritius in a cleft of rock, into which the sea flowed; and the person who took them was obliged to break away the stone before he could secure the prize. The only shells to which they bear

resemblance are some of those to which various authors have given the name of *saxatilis*, under which name more than one or two species, as I am inclined to think, have been confounded. Our shell, however, differs from all these, not only in the number of the *varices* (which, I am aware, form rather a precarious specific character in the genus *Murex* of Lamarck) but also in form and habit. From the *Murex saxatilis*, Lam. it differs entirely.

Lamarck's description is as follows. (Syst. p. 167. No. 34.)

“ Rocher feuille de scarole. *Murex saxatilis*.

M. testâ subfusiformi, valdè ventricosâ, sexfariam frondosâ, transversim rugosâ et striatâ, albâ, roseo aut purpureo zonatâ; frondibus simplicibus, erectis, foliaceis, complicato-canaliculatis; caudâ umbilicatâ, compressâ; fauce roseo-purpurascente.

Murex saxatilis. Lin. Gmel. p. 3529. No. 15.

Rumph. Mus. t. 26. f. 2.

Regenf. Conch. 1. t. 9. f. 26.

Martini, Conch. 3. t. 108. f. 1011—1014.

Habite l'Océan des grandes Indes, etc. Mon cabinet. C'est peut-être la plus grande des espèces parmi les rochers à six rangs de franges. Ses varices sont formées par des rangées de lames foliacées, en general assez droites, canaliculées, non laciniées, et un peu pointues à leur sommet. Ouverture grande, vivement colorée de rose. Longueur. 7 pouces 4 lignes. Vulg. la *pourpre-de-Gorée*. Cette coquille est d'un roux brun dans sa jeunesse.”

Our shells are full grown, and a comparison of Lamarck's description and Martini's figures with our's, will at once point out the wide distinction between *M. saxicola* and *M. saxatilis*.

It may not be impertinent to say a word about the confusion which envelopes the *M. saxatilis* of authors. Almost every reference presents us with the figure of a different shell. Gmelin, and after him, Turton, refer to two whole plates of Martini (107, 108, with the exception of one figure) for *M. saxatilis*. The reference consists of no less than eleven figures, four of which only (in pl. 108) are referred to by Lamarck for the young and old state of his *M. saxatilis*, and indeed the rest not only differ from

these four, but, for the most part, from each other. Dillwyn seems to have been perfectly aware of this confusion, but, generally useful as his catalogue is, a resort to his numerous references in this instance, will soon prove to the student whether he has added to the obscurity or diminished it. It is to be hoped that some one qualified for the task will undertake a monograph of the genus. Lamarck has done a great deal; but a great deal remains to be done.

I am not aware that any one has observed the labial tooth which projects from the external lip of many of the *Murices*. It is very much developed in perfect specimens of *M. radix*, more especially in those which come from Panama. I have seen it also very much exerted in *M. ramosus* and other species. It may be traced at each stage of growth when it is well developed. *M. saxicola* has it, but not so strongly marked as the shells above mentioned. Its use, in our present state of ignorance of the habits of the animal, we are left to conjecture.

ART. XXII. *On a new Genus of Iguanidæ.* By THOMAS BELL, Esq. F.L.S.

THE multitude of new forms which are daily presenting themselves to the observation of the Zoologist, and the consequently improved knowledge we obtain of the affinities by which the various groups of animals are connected, have gone far to establish principles of classification, probably approaching to the grand plan upon which the animated world was created. Still however our knowledge of the natural arrangement must be confessed to be as yet confined to a feeble glimmering of light, the first bright line, as it were, of dawn, but gradually widening and brightening, and rendering the prospect more and more distinct and clear, with every additional ray that is poured upon it. Although therefore numbers of those links which entered into the construction of the original chain of nature, have doubtless been irremediably lost, there is yet reason to anticipate that the

gradually increasing knowledge of those which yet remain, may at length be sufficient to indicate to us the harmony and perfection with which the grand whole was conceived and produced.

It is only however by carefully examining and accurately recording every isolated individual that may be discovered in our researches, that any steps can be taken towards the attainment of this, the grand object of every true Naturalist; and in this point of view every newly discovered species is of importance, especially when appearing in a form differing essentially from any hitherto observed, although its immediate relations may not be at once accurately defined or understood. There are in fact occasionally seen certain deviations from any known groups of animals, and from any forms with which we were before acquainted, which claim even for a single species, a distinct place in our attempts at arrangement: and if this separation be made upon sufficient grounds, and with scientific views, it generally happens that subsequent discoveries, by filling up the hiatus, tend to establish such a distribution. It is with this impression that I feel myself called upon to consider the subject of this paper, as belonging to a separate type in point of structure, from those with which, according to the strict rules, not of Linnæus, but of *Linneans*, it would have been more closely associated. It is not my intention to occupy a moment in endeavouring to establish the necessity of applying new generic terms to designate those minor groups, or those new and distinct forms, which, in the present state of zoological knowledge, crowd upon us at every step: this has been already so well and so unanswerably done with regard to ornithology by my friend Mr. Vigors, one of the most enlightened zoologists in this country, as to render any farther attempts unnecessary; as the same arguments which he has adduced, in his own favourite department, are equally available in every other. I would only observe, that, if there be in the whole range of Zoological Science one department which requires this kind of reform more than another, it is that to which my present subject belongs, the *Amphibia*, namely, of Linnæus.

Although therefore the species I am now about to describe must be considered as belonging to the family of *Iguanidæ*, a

natural and most important group amongst the Saurian reptiles, its structure is such as to demand for it a more distinct place, than that of a mere species of the typical genus; and this will be readily conceded when the structure of the head is particularly remarked, which differs so totally from that of any other individual of the family, as to point out some important deviation in its food.

Familia. IGUANIDÆ. Mibi.

Genus. AMBLYRHYNCHUS.

Char. Gen.

Caput breve, truncatum, suprâ tuberculatum.

Gula edentula.

Cervix, dorsum atque cauda, denticulato-cristatæ.

Digitî simplices.

Head short, truncated, tuberculated above.

Throat without spines.

Neck, back, and tail with a spiny crest.

Toes simple.

AMBLYRHYNCHUS *cristatus*.

Habitat in Mexico.

Mus. nostr.

Icon. Tab. Supp. XII.

Sent from Mexico by Mr. Bullock, junior.

DESCRIPTION.

The head is very short and truncated. It is covered above with large, subacute, and prominent tubercles, somewhat symmetrically arranged, of which those just anterior to the vertex are the longest. The vertical scale is depressed and flat, surrounded by a circle of small tubercles. The muzzle is rounded, and so obtuse that the outline of the whole head in front, from ear to ear, forms little more than a semicircle, and is about as high as it is long and wide. The teeth are numerous, and instead of being minutely serrated at the edges as in the true

Iguanas, they are distinctly trilobate.* The nostrils which are oval and somewhat projecting, are placed immediately in front, about half an inch above the mouth. The eyes are situated about the same distance behind the nostrils. The ears are small, and the *membrana tympani*, as in the rest of the family, quite superficial. The throat does not appear to have any considerable pouch, but my specimen is so badly stuffed that it is impossible to ascertain the exact natural size and figure of this part. The body is covered with small scales, which are rather larger upon the back, and of a pointed conical form, so as to render the surface scabrous. Immediately behind the occiput, commences the cervical crest, consisting of a series of about twenty spines, closely arranged, of which the central ones are very long and large, but those beyond the first ten becoming suddenly smaller, and terminating almost insensibly in the commencement of the dorsal crest, which consists of similar spines; those of the anterior part being long, rounded and straight, but becoming regularly shorter, flatter, and more curved backwards, to the middle of the tail, where they gradually encrease a little in length and breadth, and then again diminish to the termination. They are about 120 in number, exclusive of the cervical, of which 80 may be considered as belonging to the back. The legs are strong and large, and the toes differ from those of any others of the family in being nearly of equal length. The claws are remarkably strong, and much hooked. There are 24 femoral pores on each side. The tail is round, except towards the extremity, where it is flattened at the sides. It is covered with scales of considerable size arranged in rings; those of the upper part being the largest.

The general aspect of the animal gives the idea of great strength. The only specimen I have seen, and which is in my collection, has become so faded that little can be said about its natural colour, except that here and there indications may be perceived of the usual mottled appearance of the *Iguanas*.

* Supp. Pl. XII. a.

DIMENSIONS.

	feet.	in.	lines.
Total length	2	9	2
Length of the head	—	1	7
Breadth of the head	—	2	—
Length of the body	1	1	—
————— tail	1	6	5
————— fore leg & foot	—	5	5
————— hind leg & foot	—	8	—
————— longest claw...	—	—	6

On a comparison of this animal with the true *Iguanas*, the most striking and important discrepancy is in the form of the head. Instead of the long, pointed, narrow muzzle of those species, we have here a short, obtusely truncated head, not so long as it is broad, the mouth consequently only capable of being opened to a very short space. These circumstances, with the shortness and equality of the toes, and the strength and curvature of the claws, evidently indicate some striking peculiarity in its food and general habits, on which however, in the absence of all certain information, I shall abstain from offering any conjecture.

ART. XXIII. *A Tabular view of the Genera composing the Class Cirripedes, with Descriptions of the Species of Otion, Cineras, and Clyptra.* By WILLIAM ELFORD LEACH, M.D. F.R.S. L.S., &c.

Classis 1. CIRRIPEDES.

Ordo 1. CAMPYLOSOMATA.

Corporis basis pedunculiformis, tendinosa, flexilis; pars superior valvis testaceis 4 aut 5 instructa, anticè ad transitum pedum longitudinaliter incisa.

Familia 1. CLYTIADÆ.

Corpus suprà nunnihil compressum, squamis quinque parvis plerumque linearibus instructum.

- Corpus supra processibus duobus cylindricis membranaceis
 instructum 1 Otion.
 — supra simplex 2 Cineras.

Familia 2. POLLICIPEDIDÆ.

Corpus supra, sæpius valdè compressum, pedunculus squamis
 tectus.

- | | | | | |
|--------|---------|---|---|---------------|
| Squamæ | { | quatuor, pedunculus nudus..... | 3 Clyptra. | |
| | | quinque, pedunculus nudus..... | 4 Pentalasmis. | |
| | { | tredecim | { pedunculus nudus..... | 5 Smilium. |
| | | | { pedunculus squamis imbri-
catis tectus | 6 Scalpellum. |
| { | plurimæ | { pedunculus squamis imbri-
catis tectus | 7 Pollicipes. | |
| | | { pedunculus nudus..... | 8 Absia. | |

Familia 3. IBLADÆ.

Corpus teretiusculum, supra 4-squamosum 9 Ibla.

Ordo 2. ACAMPTOSOMATA.

Corpus testâ indivisâ, aut multipartitâ defensum, supra operculo
 clausâ, pedes sub aut inter operculi valvas exeuntes.

Familia 1. CORONULADÆ.

Operculum carnosum, exsertum, valvis testaceis 4, circumlum fere
 delinientibus, instructum. Testa basi aperta.

- | | | | |
|-------|---|--|------------------------------------|
| Testa | { | subcylindrica, basi paululum angustior,
valvis operculi æqualibus | 1 Tubicinella. |
| | | basi latior, operculi
valvis | { duabus, æqualibus. 2 Coronula. |
| | | | { quatuor æqualibus. 3 Chelonobia. |

Familia 2. BALANIDÆ.

Operculum testaceum, bivalve,* compressum. Testæ basis
 testacea.

* Plerumque 4-partium. Ed.

* Basis cyathiformis aut infundibuliformis.

Testa	indivisa: basis	immersa, valvæ indivisæ 4	Savignium.
		immersa, valvæ bipartitæ,	
		angulares 5	Pyrgoma.
		immersa, valvæ Balani 6	Megatrema.
		exserta, valvæ Balani 7	Adna.
	4-partita, valvæ Balani 8		Creusia.
	sextipartita, valvæ	spinosæ, versus apertu-	
		ram hiantes 9	Acasta.
		simplices, ad apertu-	
		ram attingentes 10	Messula.

** Basis polymorpha.

Testa	{	sextipartita	11	Balanus.		
		quadripartita	{	cellulosa	12	Conia.
				solida	13	Elminius.

Familla 3. CLISIADÆ.

Operculum testaceum, univalve, anticè elevans.

Testa quadripartita, solida; operculum bipartitum . 14 Clisia.

Genus OTION.

Species 1. O. BELLIANUS.

O. squamis inferis arcuatis, infra angustioribus: posticâ infra acuminatâ; appendicibus auriformibus mediocribus, purpurascens maculatis; corpore super pedunculum utrinque vittis tribus purpurascens, exteriore obliquâ, posterioribus rectis.

Hab. in Mare Hispanico ad Barcelonæ littora.

Mus. nost. in Mus. Brit. communicavit mihi amicus carissimus Thomas Bell, Arm.

Description.—The lower valves of this Otion are arched and narrow at the lower part; the posterior valve acuminate, auriform appendages of moderate size, spotted with purplish, the body above the peduncle with three purplish stripes on each side, the outer of which is oblique and the posterior ones straight.

Species 2. *O. BLAINVILLIANUS*.

O. squamis inferis subrectis; infra acuminatis; posticâ lineari; appendicibus auriformibus violascente maculatis; corpore violascente fasciato, fasciis e punctis effectis.

Lepas cornuta, *Mont. Trans. Linn. Soc.* XI. 179. t. XII. f. 1.

Otior Blainvillii, *Leach, Journ. de Phys.* LXXXV. (1817.) 67.

——— *Encycl. Brit. Suppl.* III. 170. t. LVI.

f. dextra.

Mus. Mont. in Mus. Brit.

Description.—Lower valves nearly straight, acuminate below; posterior valve linear; auriform appendages spotted with violet; body with violet bands composed of dots. Montagu found this species on the planks of a Transport, wrecked on the coast of Devonshire.

Species 3. *CUVIERIANUS*.

O. squamis inferis subarcuatis, infra acuminatis, posticâ punctiforme, appendicibus auriformibus mediocribus; colore testaceo.

Otior Cuvieri, *Leach, Journ. de Phys.* lxxxv. (1817), 67.

——— *Encycl. Brit. Suppl.* iii. 171. t. lvii.

f. centralis.

Lepas aurita, Wood Gen. Conch. i. 70. pl. 4. (pessima).

Habitat —?

Mus. D. Cuvier.

Description.—Lower valves rather arched, acuminate below; posterior valve dot-shaped: auriform appendages of moderate size; colour testaceous.

Species 4. *O. DUMERILLIANUS*.

O. squamis inferis angulatis, infra acuminatis; posticâ obsoletâ; appendicibus auriformibus violascente maculatis; corpore supra pedunculum violascente vittato.

Mus. nost. in Mus. Brit.

Description.—Lower valves angular, acuminate below; posterior valve obsolete; auriform appendages spotted with violet: body above the peduncle with violet stripes. I received this

species from my liberal friend Professor Dumeril, who found it on the bottom of a vessel lately returned from the Isle of France.

Species 5. *O. RISSOANUS*.

O. squamis inferis convexiusculis, geniculatis, (genu rotundato) posticè supra truncatis, infra gradatim acuminatis; corpore, pedunculoque purpurascentibus; appendicibus auriformibus intensè purpureis.

Mus. D. Risso.

Hab. in Mari Mediterraneo.

Description.—Lower valves rather convex, geniculated; (the knee rounded) the upper part truncated behind and the lower part gradually acuminated; body and peduncle purplish, auriform appendages deep purple.

Genus CINERAS.

Species 1. *C. CHELONOPHILUS*.

C. corpore lanceolato; pedunculo abrupto; squamis superioribus minutis, posticè acuminatis; squamâ posticâ rectâ, lineari.

Hab. in corpora Cheloniorum; observat Dom. J. Cranch, in lat. bor. 36° et long. occid. 16°—32°.

In Museo Britannico.

Description.—Body lanceolate, peduncle abrupt; upper valves minute, acuminated behind; posterior valve straight, linear.

Species 2. *C. CRANCHIANUS*.

C. corpore, supra obliquè truncato; pedunculo subabrupto; squamis superioribus linearibus, utrinque obtusis; squamâ posticâ ad apicem gibbosâ; squamis anticis processû postico, brevi, obtuso.

Hab. in Mari Atlantico Australi. Observat D. Cranch.

In Mus. Brit.

Description.—Body above obliquely truncated; peduncle rather abrupt; upper valves linear, obtuse on each side; posterior valve gibbous at the apex; anterior valves with a short, obtuse, process behind.

Species 3. *C. MEGALEPIS*.

C. pedunculo subabrupto ; squamis superioribus linearibus, utrinque obtusis ; squamâ posticâ in medium gibbosâ ; squamis anticis processû postico subelongato.

Hab. in Mari Mediterraneo littoribus Barcelonæ.

Mus. nostr. in Mus. Brit. Communicavit amicus meus carissimus Thomas Bell, Arm.

Description.—Peduncle rather abrupt ; superior valves linear, obtuse on each side ; posterior valve gibbous in the middle ; anterior valves with a rather elongated posterior process.

Species 4. *C. MONTAGUI*.

C. corpore gradatim clavato, elongato, supra obtuso ; squamis superioribus linearibus ; squamâ posticâ medium versus subgeniculatâ, aut gibbosâ ; squamis anticis processû postico brevî, obtuso.

Lepas membranacea. *Mont. Test. Brit.* ii.

—— *Trans. Linn. Soc.* xi.

Cineras vittata. *Leach, Encycl. Brit. Suppl.* iii. 170. t. lvii. f. dextra superior.

Lepas vittata. *Wood Gen. Conch.* i. 69. pl. xii. f. 2. 3.

Hab. in Oceano Europæo et Mari Mediterraneo.

Description.—Body gradually clavate, elongated, obtuse above ; upper valves linear ; posterior valve rather geniculated or gibbous near the middle ; anterior valves with a short posterior process.

Species 5. *C. OLFERSIANUS*.

C. corpore supra acuminato ; squamis superioribus utrinque, posticè præsertim, acuminatis ; squamâ posticâ in medium subgeniculatâ.

Hab. in Fucum natantem in Mari Atlantico Australi ; detexit Dom. J. Cranch.

Mus. Brit.

Description.—Body above acuminate ; upper valves acuminate at both ends, particularly behind ; posterior valve rather geniculated in the centre.

Species 6. *C. RISSOANUS*.

C. corpore supra trigono, squamâ posticâ medium versus geniculatâ ; squamis anticis processû postico brevi. Risso MS.

Color griseo-cœrulescens, lineis atris flexuosis, longitudinalibus notatus.

Lepas cinerea. *Poli*, vi. 20?

Cineras cinerea. Risso MS.

Hab. in Mari Mediterraneo, prope Nice, scopulis adhærens.

Description.—Body above triangular, posterior valve geniculated near the middle ; anterior valves with a short posterior process. Colour bluish grey, marked with flexuous longitudinal black lines.

Genus CLYPTRA.

Species 1. *C. CANCRORUM*.

C. corpore azureo pallido ; squamis violascentibus ; anticis acutè angulatis, posticis arcuatis.

Clyptra Cancrorum, Savigny MS.

Mus. J. C. de Savigny.

Hab. in Mari rubro. Corporis altitudo $\frac{1}{8}$ unc.

Description.—Body pale azure colour ; valves violaceous : anterior valves acutely angulated ; posterior valves arched.

Genus SCALPELLUM.

Species 1. *Sc. VULGARE*.

Sc. lamellis superioribus obliquè striatis ; posticâ longitudinaliter striatâ ; inferioribus concentricè striolatis.

Scalpellum vulgare. *Leach*, *Encycl. Brit. Suppl.* t. lvii. f. secunda sinistra.

Hab. in Mari Atlantico, Britannico et Mediterraneo, Fucis adhærens.

Description.—Upper valves obliquely striated ; posterior valves longitudinally and inferior valves concentrically, striated.

Species 2. *Sc. LÆVE*.

Sc. valvis omnibus glaberrimis, lævibus : superioribus obliquè striolatis ; posticâ longitudinaliter striolatâ ; inferioribus striolis angustissimis sculptis.

Scalpellum læve. Risso MS.

Hab. in Mari Mediterraneo prope Nice, scopulis adhærens.

Description.—Valves all very even and smooth ; upper ones obliquely, posterior one longitudinally, striolated : lower valves marked with very fine narrow striæ.

ART. XXIV. *Some Account of the Mode in which the Boa Constrictor takes its Prey, and of the adaptation of its organization to its Habits. By W. J. BRODERIP, Esq. F.L.S., &c.*

Few persons are unacquainted with Mr. M'Leod's book ;* and none, who have read that very interesting narrative, will forget the admirable though painful description of the mode, in which the serpent, taken on board the *Cæsar* at Batavia, dealt with his prey. Two points in that description, however, always struck me forcibly ; the one as being contrary to the probable structure of the animal, the other as being contrary to my own observations. It will be necessary for me to premise that I have not a single doubt of the correctness of Mr. M'Leod's statement as far as it goes ; and, having said thus much, I proceed to notice the two points on which it is my intention to offer a few observations.

Mr. M'Leod says, (p. 260.) with much appearance of reason, "with all this he (the serpent) must be so formed as to be able to suspend, for a time, his respiration, for it is impossible to conceive that the process of breathing could be carried on while the mouth and throat were so completely stuffed and expanded by the body of the goat, and the lungs themselves (admitting the trachea

* "Narrative of a Voyage in his Majesty's late ship *Alceste*, by John M'Leod, Surgeon of the *Alceste*."—*Murray*.—1817.

to be ever so hard) compressed as they must have been by its passage downwards."

At p. 257, he notices the agony and distress of the prey in terms so lively, that it is impossible not to sympathize with "the poor goat" and to feel "all the horrors of its perilous situation."

I will take these two points in the order in which they are quoted: but, before I arrive at them, it may not be thought impertinent if I state that the serpent which was shipped at Batavia was probably not a *Boa* but a *Python*, (all the species of the former genus yet discovered being natives of the New World;) and, if I give some account of the manner in which the *Boa Constrictor* takes its prey in this country.

In March last Mr. Cop of the Lion Office, in the Tower, sent to inform me that one of these reptiles had just cast his skin, at which period, they, in common with other serpents, are most active and eager for prey. Accordingly I repaired with some friends to the Tower, where we found a spacious cage, the floor of which consisted of a tin case covered with red baize and filled with warm water so as to produce a proper temperature.—There was the snake "*positis novus exuviis*," gracefully examining the height and extent of his prison, as he raised, without any apparent effort, his towering head to the roof and upper parts of it, full of life, and brandishing his tongue.

A large buck rabbit was introduced into the cage. The snake was down and motionless in a moment. There he lay like a log without one symptom of life, save that which glared in the small bright eye twinkling in his depressed head. The rabbit appeared to take no notice of him, but presently began to walk about the cage. The snake suddenly, but almost imperceptibly, turned his head according to the rabbit's movements, as if to keep the object within the range of his eye. At length the rabbit, totally unconscious of his situation, approached the ambushed head. The snake dashed at him like lightning.—There was a blow—a scream—and, instantly, the victim was locked in the coils of the serpent. This was done almost too rapidly for the eye to follow: at one instant the snake was motionless;—in the next he was one congeries of coils round his prey. He had seized the rabbit by the

neck just under the ear, and was evidently exerting the strongest pressure round the thorax of the quadruped ; thereby preventing the expansion of the chest, and, at the same time, depriving the anterior extremities of motion. The rabbit never cried after the first seizure :—he lay with his hind legs stretched out, still breathing with difficulty, as could be seen by the motion of his flanks. Presently, he made one desperate struggle with his hind legs ; but the snake cautiously applied another coil with such dexterity as completely to manacle the lower extremities, and, in about eight minutes, the rabbit was quite dead. The snake then gradually and carefully uncoiled himself and finding that his victim moved not, opened his mouth, let go his hold and placed his head opposite to the fore part of the rabbit. The *Boa* generally, I have observed, begins with the head ; but, in this instance, the serpent, having begun with the fore-legs, was longer in gorging his prey than usual, and, in consequence of the difficulty presented by the awkward position of the rabbit, the dilatation and secretion of lubricating mucus was excessive. The serpent first got the fore-legs into his mouth ; he then coiled himself round the rabbit and appeared to draw out the dead body through his folds ; he then began to dilate his jaws, and, holding the rabbit firmly in a coil as a point of resistance, appeared to exercise, at intervals, the whole of his anterior muscles in protruding his stretched jaws and lubricated mouth and throat at first against, and soon after, gradually upon and over his prey. The curious mechanism in the jaws of serpents which enables them to swallow bodies so disproportioned to their apparent bulk is too well known to need description ; but it may be as well to state that the symphysis of the under jaw was separated in this case, and in others which I have had an opportunity of observing. When the prey was completely ingulphed, the serpent lay for a few moments with his dislocated jaws still dropping with the mucus, which had lubricated the parts ; and, at this time, he looked quite sufficiently disgusting. He then stretched out his neck, and, at the same moment, the muscles seemed to push the prey further downwards. After a few efforts to replace the parts, the jaws appeared much the same as they did previous to the monstrous repast.

I now proceed to the first of the two points above alluded to, and have to state my opinion, that the *Boa Constrictor* does respire "when his head and neck has no other appearance than that of a serpent's skin stuffed almost to bursting;"* and I think that, upon a more close examination, the same phenomenon would have been observable in the serpent shipped at Batavia. It is to be regretted that the dissection of that serpent appears to have been confined to the stomach: at least nothing is said of any other part of the animal. I have never had an opportunity of dissecting the pulmonary system of a *Boa*,† or of satisfying myself as to the structure of the extremely long trachea,‡ which must be very firm to resist such an immense pressure; but I believe, from a near and accurate inspection, in company with others, that respiration goes on during the period of the greatest dilatation. While these serpents are in the act of constringing or of swallowing their prey, they appear to be so entirely pervaded by the *oφiξis* which then governs them, that I am convinced they would suffer themselves to be cut in pieces before they would relinquish their victim. I have assisted in taking them up and removing them with their prey in their coils, without their appearing to be in the least disturbed by the motion, excepting that if, after the victim is no more and the constriction is somewhat relaxed, an artificial motion be given to the dead body, they instantly renew the constriction. When thus employed they may be approached closely and with perfect security for the reason above stated, and I have uniformly found that the larynx is, during the operation of swallowing, protruded sometimes as much as a quarter of an

* M^r Leod's Narrative, p. 260.

† Speaking of the lungs of the reptiles Cuvier says, "Il n'y en a qu'un seul, dans les *ophidiens*, extrêmement long, et se prolongeant au-dessus de l'œsophage, de l'estomac et du foie, jusqu' au-delà de ces derniers. Cette situation fait qu'il doit être comprimé toutes les fois que l'animal avale une proie d'un certain volume; ce qui gêne sans doute alors la circulation pulmonaire, et contribue probablement à l'engourdissement qu'éprouvent les *serpens* après qu'ils ont fait un repas copieux." *Leçons d'Anatomie comparée*. Tom. 4. p. 347.

‡ Speaking of "Serpens proprement dits," Cuvier says, "leur trachée-artère est très-longue." *Règne Animal*. Tom 2. p. 64.

inch beyond the edge of the dilated lower jaw. I have seen in company with others, the valves of the glottis open and shut, and the dead rabbit's fur immediately before the aperture stirred, apparently by the serpent's breath, when his jaws and throat were stuffed and stretched to excess. In the case above mentioned, where the prey was taken very awkwardly, and the dilatation was consequently much greater than usual, I saw this wonderful adaptation of means to the exigencies of the animal much more clearly than I had ever seen it before.

With regard to the next point, it is more difficult to account for the variance between the agony of antipathy shewn by the goat as described by Mr. McLeod, and the indifference which I have uniformly observed in the full grown fowls and rabbits presented to these serpents for prey. Immediately after our *Boa* had swallowed his first rabbit, a second was introduced; but the serpent now exhibited a very different appearance. The left side of his lower jaw was hardly in its place, and he moved about the cage instead of lying in wait as on the former occasion. As for the rabbit, after he had been incarcerated a little while, he treated the snake with the utmost contempt, biting it when in his way and moving it aside with his head. The snake, not having his tackle in order, for his jaw was not yet quite right, appeared anxious to avoid the rabbit, which at last stumbled upon the snake's head in his walks and began to treat it so roughly, that the rabbit was withdrawn for fear of his injuring the snake. This treatment of the snake by the rabbit did not appear to be the effect of anger or hatred, but to be adopted merely as a mode of removing something, which he did not appear to understand, out of his way. I have seen many rabbits and fowls presented to different specimens of *Boa* for prey, and I never saw the least symptom of uneasiness either in the birds or quadrupeds. They appear at first to take no notice of the serpent, large as it is, and when they do discover it they do not start but seem to treat it with the greatest indifference. I remember one evening going up into the room where one of these snakes was kept at Exeter 'Change, and seeing the hen, which was destined for the prey of the *Boa*, very comfortably at roost upon the serpent. The keeper

took the hen in his hands and held it opposite to the head of the snake without succeeding in inducing him to take the bird, which, when let out of the keeper's hands, again settled herself down upon the serpent for the night.

The only solution, which I can offer, of the difference between Mr. McLeod's description and my experience, is one which I do not propose as absolutely satisfactory, but which may, nevertheless, be found to approach the truth. The goats put on board at Batavia for the serpent, which, it appears, was brought from Borneo, were in all probability, natives of Java, and, if so, they would, according to the wonderful instinct which nature has implanted in animals for their preservation, be likely to have a violent antipathy to large serpents, such as those which there lurk for their prey. The great *Python* is a native of Java, and, if these goats were wild, or originally from the wild stock of the island, their instinctive horror at the sight of the destroyer may be thus accounted for. But our domestic fowls and rabbits (the stock of the latter most probably indigenous, and that of the former of such remote importation, and so much changed by descent as to be almost on the same footing,) having no such natural enemy as a large serpent on which it is necessary for them to be on their guard, are entirely without this instinct, although it is strong enough in the case of their ordinary enemies, such as hawks, dogs and cats, and they consequently view the *Boa* which is about to dash at them with the same indifference as if he were a log of wood.

It may not be amiss to give persons who have the care of these reptiles a hint, not to expose their hands too much in holding fowls, &c. to the head of a *Boa* when near shedding its skin, and, consequently, nearly blind (for the skin of the eye is changed with the rest) in order to induce it to take its prey. Mr. Cop, the keeper of the Lion Office, was, a few weeks ago, holding a fowl to the head of the largest of the five snakes which are there kept, when the serpent was in this condition. The snake darted at the bird, missed it, but seized the keeper by the left thumb, and was coiled round his arm and neck in a moment. Mr. Cop, who was alone, did not lose his presence of mind, and, immedi-

ately, attempted to relieve himself from the powerful constriction by getting at the snake's head. But the serpent had so knotted himself upon his own head, that Mr. Cop could not reach it, and had thrown himself on the floor in order to grapple with a better chance of success, when two other keepers coming in, broke the teeth of the serpent, and, with some difficulty, relieved Mr. Cop from the fate of Laocoon, which might otherwise have been his portion. Two broken teeth were extracted from the thumb, which soon healed; and no inconvenience of any consequence was the result of this perilous adventure.

Note.—Although it is quite unnecessary to add any attestation to the accuracy of Mr. Broderip's interesting account, yet as that gentleman has particularly requested me to do so, I beg to state that my own observations, and they have not been unfrequent, have on every point been completely confirmatory of those recorded in the preceding paper. T. B.

ART. XXV. *Description of the HELARCTOS EURYSPI-
LUS; exhibiting in the Bear from the Island of
Borneo, the type of a Subgenus of URSUS. By
THOMAS HORSFIELD, M.D. F.L. & G.S., &c.*

It will appear even to a superficial observer, that the animal which in the following communication has been named *Helarctos euryspilus*, and defined as the type of a subgenus of *Ursus*, is very nearly related to the *Ursus Malayanus* which was described in the Zoological Researches in Java. The characters which in my opinion mark it as a distinct species, will with more propriety be detailed after the following description; but a few introductory remarks are required, both regarding the scientific history of the Malayan Bear and the occasion of the following account of the Bear from Borneo.

When about three years ago, I gave a concise description of the *Ursus Malayanus*, as it is found in Sumatra, my chief object was to bring before the public, at an early season, all the information afforded by the materials which had been forwarded to

the East India Company by Sir Stamford Raffles. Whatever was then communicated was derived from these materials, and from the catalogues which accompanied them. I could not at that time anticipate that an opportunity would soon be afforded of examining in a living state, an animal belonging to the same subdivision of the genus *Ursus*, (to which I have applied the name of *HELARCTOS* from *ἥλ*, *calor solaris* and, *αρκτος ursus*,) brought from the Island of Borneo, which is so nearly allied to the Malayan Bear, that its true specific distinction may in the opinion of many persons require further confirmation. But as the opportunity occurred it became incumbent on me, not only to review my former description and to compare it with the living animal, but, if possible, to communicate to the public, the result of my later observations.

Regarding the history of the Malayan Bear, I have to observe, that as far as I have been able to discover, this animal is not mentioned by any systematic writer previous to the publication of the 13th Volume of the Transactions of the Linnean Society in 1821; and Mr. Marsden doubtless deserves the credit of having first described it as a native of Sumatra, and of having communicated some information concerning its manners. The knowledge of the existence of a species of Bear in Borneo, has long been familiar to naturalists who have visited the Eastern Archipelago; but the indications of it which are supposed to be contained in some of the Oriental voyages and travels have hitherto escaped my research. The Malayan Bear is mentioned by M. Cuvier in the enumeration of living Bears contained in the 4th Volume of his "*Recherches sur les Ossements Fossiles*," where the name of *Ursus Malayanus* receives his sanction, and M. Frederic Cuvier, in the 41st Number of the "*Histoire Naturelle des Mammifères*," which contains a figure of our animal, has likewise adopted this name. In the year 1819, a specimen of the Malayan Bear, obtained at Bencoolen, was brought to England in the Ship William Pitt, and presented to Lady Banks. This, I have been informed, was examined and described by Dr. Leach, but we have to regret that the result of his researches on this subject, has been lost to the scientific world. The prepared specimen is now de-

posited in the British Museum. The animal which has served for the following description, now forms part of the Menagerie in the Tower of London. It was brought from Borneo, but the history of its introduction will be adverted to in the sequel. I proceed to the description.

The *Helarctos curyspilus* exhibits the most distinguishing character in the form of its head. The cranium is in comparison with other *Ursi*, of extraordinary size. Its contour above is nearly hemispherical, and laterally it expands in an oblique direction outwards. The forehead rises in an arch immediately behind the nose. The eyes are situated anteriorly, near this organ, the ears on the contrary are removed to the posterior extremity of the skull, and the space between both is very great. Immediately before the eyes the skull is abruptly contracted and passes into an obtuse very gradually attenuated rostrum. The nose is large and considerably elevated, it passes with uniform breadth to the extremity, which is somewhat obliquely truncated. It has a lateral notch which communicates with the nostrils, and which the animal can greatly expand by a voluntary effort. The nostrils have oblong apertures which are directed forward and divided by a very narrow septum. It may be remarked, regarding the nose, that it is less developed than in the *Ursus labiatus* of Blainville, but more than in the common Bear: by drying its form is considerably changed, as appears in the figure formerly published; the covering of the nostrils which is observed in this figure, is formed by the contraction of the fleshy extremity. The upper lip is lax and fleshy and in some degree pendulous; the animal has the power of contracting it laterally and of thrusting it forward as a short trunk or proboscis. The lower lip is small, compressed and partially concealed by the upper. Both lips are covered interiorly by transverse fleshy rugosities and warts. Numerous straggling hairs about an inch in length and of a gray colour, are scattered along the borders of the upper lip, but our animal is devoid of stiff projecting vibrissæ. The eyes, which are situated at the union of the rostrum with the skull, are small and without vivacity; the irides are violet with a vitreous, opaline cast, and the pupils are very minute. The ears are short, oblong, obtuse and directed backwards; thick

tufts of short hairs are placed, near the base of the auricles above and underneath, but along the border the hairs are very short and of a lighter colour, in consequence of which, the ears appear, as in the Malayan Bear, cropped by art. The *meatus auditorius externus* is concealed by a tuft of short hairs. The gape of the mouth is considerable, and the animal has the habit of opening its jaws widely, as if yawning, and of thrusting out its tongue, which next to the extreme size of the head, constitutes its most distinguishing character. It is long, narrow, slender and very extensile. The animal after expanding its jaws, as described, projects it forward nearly one foot, and then curves it inwards in a spiral manner. The tongue then appears nearly smooth and even from the middle to the point, but covered at the base with numerous compressed *papillæ* of a round or oblong form. The teeth, as far as I have been able to ascertain from the subject, agree generally with the character of *Ursus*. I have only to offer the following remarks. The anterior or false grinders in the upper jaw are minute and in close contact with the canine teeth; two only were distinctly apparent; the third, between the two former, which exists in the prepared skull described and figured by M. Cuvier in his notices on the Malayan Bear, was not observed in the examination which I had an opportunity of making, in the living subject: the two posterior grinders are very large, tuberculated, and compressed. In the lower jaw the false grinders are somewhat larger than above; the posterior teeth are narrow, and have a long strongly compressed crown. Of the front teeth, the two exterior in the upper jaw are somewhat obliquely diverging, the four intermediate teeth present nothing remarkable. In the lower jaw the two exterior teeth are broad and notched, the two next project at the base farther into the mouth than the intermediate teeth; of these one only is remaining in the specimen exhibited in the Tower. The canine teeth are robust and of great length.

In the neck, body, and extremities, our animal agrees, in general, with the genus *Ursus*. It is perhaps somewhat shorter in its proportions, somewhat more contracted (*ramassé*), and the great proportional breadth of the head, extends also to the neck and

body. These parts, above, are broader than in the true *Ursi*. The neck is short and thick, the body cylindrical but gross and heavy; at the rump it is rather abruptly rounded towards the thighs, which are stout and short. The anterior extremities are somewhat longer and more slender than the posterior. The feet are strictly plantigrade, but their naked callous portion is shorter in the Bornean as well as in the Malayan Bear, than in other species of the genus *Ursus*. Each foot has five toes which are narrow, compressed, and fitted for a slight independent motion, by which our animal is enabled, in some degree, to seize hold of objects. All the toes of the hind foot and four toes of the anterior foot are disposed in the same line; the thumb only of this foot admits of a lateral motion, which is however not sufficient to constitute a hand. The three intermediate toes are nearly of equal length, the exterior toe is slightly and the interior one or the thumb, more abruptly abbreviated. The claws are very long, strongly arched, compressed, somewhat grooved underneath, rounded above, narrow at the base and very gradually attenuated to the point, which is transversely truncated and chiefly fitted for digging the earth. Our animal however, as far as appears from the analogous habits of the Malayan Bear, may be supposed to climb with great agility. As far as I am enabled to determine from the examination of a single specimen, the claws of the *Hel-arctos euryspilus* are smaller than those of the *H. Malayanus*: in the latter the claw of the middle toe measures along the curvature, three inches; but the great length of these, which appears in the specimens preserved in various collections in London, may in some measure be owing to the contraction of the fleshy parts by drying. The tail measures about two inches in length; but one half of this consists in a tuft of rigid hairs extending beyond the vertebræ. There are two pectoral and two ventral mammæ; the latter are so indistinct that they had hitherto escaped the notice of the keeper. The fur is short and glistening; the separate hairs are scantily supplied with down at the base, somewhat rigid, but closely applied to the skin and smooth to the touch. On the forehead they are very short; hence they

gradually rise to the crown of the head, on which they are densely disposed, nearly erect, and very soft to the touch.

The *Helarctos* from Borneo has the pure, saturated jet-black tint which is observed in the Malayan Bear, on the body, head, and extremities. The muzzle including the region of the eyes, has a yellowish brown colour; the mark on the anterior part of the neck is more vivid and nearly orange; this differs in form from that of the Malayan Bear and constitutes the chief distinction of the Bornean species. It is a large, broad mark of an irregular quadrangular form, occupying a considerable portion of the neck, anteriorly. Underneath or posteriorly it is very slightly emarginate, but above it has a deep notch, gradually contracted at the base, with regularly defined sides, from which the points are very gradually diverging. The contour of the mark is very slightly curved laterally. A transverse band of a gray colour is formed on the feet by tufts of long bristly hairs arising at the insertion of the claws; its value as a specific distinction remains to be determined by future comparisons.

The *Helarctos* from Borneo, now exhibited in the Tower, measures along the back from the muzzle to the tail three feet nine inches. In an erect posture it frequently raises itself to four feet. In its usual attitude the height at the rump is eighteen inches. The length of the anterior extremities is one foot seven, and of the posterior one foot five inches. The circumference of the head is one foot ten, and of the body two feet five inches. The measure across the head from ear to ear is about nine, and the length of the middle toe and claw of the fore foot four and a half inches. Judging from these dimensions, our animal is somewhat smaller than the Malayan Bear: the largest prepared specimen of this which I have examined measures along the back four feet six inches.

The *Helarctos euryspilus* which is now described, was brought to this country above two years ago, and may therefore be supposed to have acquired its full size. The keeper has not perceived any increase in its dimensions for a considerable time. Our animal forms at present one of the most attractive and interesting spectacles among the animals confined in the Royal Menagerie.

I shall not attempt a detail of all the modifications of its manners, or to follow it through all the minutiae of character which it exhibits in confinement: these are now subjects of daily observation. My only object is to give a concise view of the most prominent traits which are more immediately connected with its organization. Our animal has been shewn to be completely plantigrade: it rests with facility on the posterior feet, and its robust thighs not only support it while sitting, but even enable it to raise itself without difficulty to a nearly erect posture. But it is more generally seen in a sitting attitude, at the door of its apartment, eagerly surveying the visitors and attracting their notice by the uncouthness of its form or the singularity of its motions. Although it appears heavy and stupid, most of its senses, particularly those of sight and smelling, are very acute. The keeper has frequently observed that it attentively regards, whatever passes before it in the court. But the olfactory organs are peculiarly strong, and appear to be in a state of constant excitement. The *Helarctos* has considerable command over the fleshy extremity of its nose, and the parts adjacent, which it often displays in a very ludicrous manner, particularly when a morsel of bread or cake is held at a small distance beyond its reach. It expands the lateral aperture of the nostrils, protrudes its upper lip by a strong effort, thrusting it forward as a proboscis, while it employs its paws to seize the object. After obtaining it and filling the mouth, it places the remainder with great calmness on the posterior feet, bringing it in successive portions to its mouth. It often voluntarily places itself in an imploring attitude, turning the head in different directions, earnestly regarding the spectators and extending the paws. The *Helarctos* readily distinguishes the keeper, and evinces an attachment to him. On his approach it employs all its efforts to obtain food, seconding them by emitting a coarse, but not unpleasant, whining sound. This it continues while it consumes its food, alternately with a low grunting noise; but if teased at this time, it suddenly raises its voice and emits at intervals harsh and grating sounds. Our animal is excessively voracious, and appears to be disposed to eat almost without cessation. When in a good humour it often

amuses the spectators in a different manner. Calmly seated in its apartment, it expands the jaws and protrudes its long and slender tongue as above described. It displays on many occasions not only much gentleness of disposition, but likewise a considerable degree of sagacity. It appears conscious of the kind treatment it receives from the keeper. On seeing him, it often places itself in a variety of attitudes, to court his attention and caresses, extending its nose and anterior feet, or suddenly turning round exposing the back, and waiting for several minutes in this attitude, with the head placed on the ground. It delights in being patted and rubbed, and even allows strangers to do so, but it violently resents abuse and ill treatment, and having been irritated, refuses to be courted while the offending person remains in sight.

The *Helarctos* now in the Royal Menagerie was obtained, in Borneo, when very young, and brought to this country by the commander of a vessel, about two years ago. During the voyage it was the constant associate of a Monkey and of several other young animals; it was thus domesticated in early life, and its manners in confinement greatly resemble those of the Malayan Bear observed by Sir Stamford Raffles. But we are as yet perfectly unacquainted with the habits of the Bear from Borneo in its native state. It is probably not inferior to the Malayan Bear in sagacity and intellect.

I have now to state the grounds on which the Bornean and Malayan Bears have been defined as a subgenus of *Ursus*, and to give the discriminating subgeneric characters. On a transient view this separation may perhaps appear unnecessary. It may even appear inadmissible to apply so rigorous and minute a subdivision to the genus *Ursus*. But a similar method has lately been applied to many genera, and I need only refer to the subdivisions which have been established by M. Frederic Cuvier and others in various Linnean genera, as *Viverra*, *Mus*, &c. These cases are familiar to every person who has attended to the subject. It is true that all the individuals of the genus *Ursus* taken comprehensively, or as a "Grand genre" *par excellence*, according to the views of Cuvier, have a very striking family

resemblance, and even the distinction of species has till very lately been difficult and vague. In proof of this it is only necessary to refer to the earlier editions of the *Systema naturæ*. Here the true *Ursi* are united in one species. But at present *ten* species are clearly defined, and among these striking differences of character are observed. It is foreign to my purpose to go into an examination of all these species, or to attempt a subdivision of the whole genus; my present object is to compare the *Helarctos* with those typical forms to which it is most nearly related, or from which it differs most widely. To this comparison it is however necessary to premise a general list of the species at present distinctly known and described. They are the following: 1. *Ursus arctos*, Linn. This will probably be found to comprise two species, for the indications of which I refer to Cuvier's *Ossements fossiles*. 2. *Ursus ferox*, Lewis and Clark, *Ursus cinereus*, Encycl. 3. *Ursus americanus*, Pallas Spic. Zool. fasc. XIV. 4. *Ursus maritimus*, Pallas Spic. Zool. XIV. tab. 1. 5. *Ursus labiatus*, Blainville, nouv. Bulletin de la Soc. Philom, 1817. *Bradypus ursinus*, Shaw, Gen. Zool. tom. 1. part 1. pl. 47. *Prochilus*, Illiger Prod. p. 109. 6. * *Ursus Malayanus*, Raffles, Tr. Linn. Soc. XIII. p. 254. 7. *Ursus Thibetanus*, Cuv. Ossem. foss. 4. p.

* M. Cuvier, in adopting the specific name of *Malayanus* as a systematic denomination, employs in his *Ossements fossiles* the French name of "*Ours de Java*." But it appears very clearly that he has been led into a mistake regarding the native country of the Malayan bear, by having the skull of it forwarded to him from Java. The Malayan bear had not been discovered in Java at my departure from that Island in 1819. And I have not been informed that the Dutch naturalists have since found this animal. It is therefore highly probable that the skull described by M. Cuvier was derived from Sumatra, where it is very abundant, although he received it by way of Java. This is a case therefore in which a topical name is erroneously applied and cannot be retained.

The employment of names taken from the countries where animals are found, or have been discovered, is a constant theme of discussion and declamation with Continental naturalists; and it has been applied very recently with little "*consideration*" to myself. M. Temminck, in the 4^e Liv. of his "*Monographies de Mammalogie*," in describing a species of *Felis*, expresses himself thus: "Si j' ai donné un autre nom à ce Chat que celui de *Felis javanensis*, sous lequel M. Horsfield en a publié la description, c'est que, de nos jours, il ne convient plus de suivre cette manière excessivement vicieuse que les na-

325. 8. *Ursus collaris*, *Ours de Sibérie*, Fréd. Cuv : Hist : Nat : des Mammifères, 42° Liv. 9. *Ours des Asturies*, Fréd. Cuv : Hist : Nat : des Mammif. &c. 44. Liv. 10. *Ours noir du Chili*, indicated by name in the same place.

I proceed to a few comparative remarks on two subdivisions of the genus *Ursus*. The *Helarctos* has one strong point of resemblance, in the olfactory organs, to the *Ursus labiatus* of Blainville. This animal, to which Illiger applied the name of *Prochilus*, exhibits one strongly characterized type of the subdivisions of the genus *Ursus*. Although Illiger's materials were imperfect, and his description, founded on a mutilated specimen, erroneous, yet his generic name *Prochilus* (*labrosus*) is correctly applied, and should be preserved. I regret that I have not the means of extending the comparison of *Prochilus* and *Helarctos* to all parts of their structure. In their external character however a resemblance exists which shows itself in an emarginate mark on the throat, having a tendency to assume the form of the letter V. In subjecting the *Helarctos* to a further examination with the *Ursi* above enumerated, it will be found that this subgenus differs most widely from the *Ursus maritimus* or Polar Bear. I have been led to assume that this animal had already been separated from the other *Ursi* as a type of a sub-genus, by Dr. Leach ; but my inquiries have afforded me no

turalistes anciens nous ont transmise, d'emprunter pour dénomination des animaux, les noms de pays, d'îles ou de contrées, puisqu' il est rare qu'une espèce se trouve confinée dans les limites de nos divisions géographiques." To this I shall oppose the following passage from the 42d Livraison of the " Histoire Naturelle des Mammifères, &c." by M. M. Geoffroy St. Hilaire & Frédéric Cuvier. " On a critiqué, avec une apparence de raison, les noms de pays donnés aux objets que peuvent exister naturellement dans des contrées fort éloignées l'une de l'autre ; mais si l'on considère, que ces noms ne sont imposés qu'à des êtres qui sont tout-à fait nouveaux, et dont on ignore l'existence partout ailleurs que dans le pays qui les fait connaître, on leur trouvera l'avantage de conserver la trace de l'origine de ces êtres pour nous ; et comme tout le monde sait, comme il est facile de convenir que ces désignations n'ont rien d'absolu, on reconnaitra que de tous les noms qui ont une signification, ce sont ceux des pays qui présentent peut-être les moins d'inconvéniens."

satisfactory result. I can therefore only suggest, on this head, the propriety of applying a name from its geographical situation, so as to oppose it in this point of view to the Equinoctial Bear. In the *Ursus maritimus* the skull has an oblong form; and is greatly lengthened and depressed, but comparatively narrow in its lateral dimensions; M. Cuvier's remarks on it, as far as regards this character, are so full and comprehensive, that I refer to them, and only extract the following details. "Le crâne, bien loin de s'élever au-dessus de la face, semble au contraire s'abaisser.— — en un mot, cette tête est plus cylindrique, plus approchante de la forme de celle de la marte au du putois, que de celle des ours ordinaires." Ossem. fossiles IV. p. 327. The figure of Pallas likewise exhibits this character in a striking manner. The skull of the *Helarctos* on the contrary, as appears from the preceding description, is almost globular, and its breadth is nearly equal to its length. M. Cuvier equally illustrates this character of our sub-genus. "L'ours de Java, est singulièrement remarquable par la saillie du crâne la plus grande convexité du crane y est autrement placée et beaucoup en arrière sur ses pariétaux, où le crâne est aussi beaucoup plus large, en sorte que son cerveau est plus globuleux." The relative length of the soles of the feet in the Polar and Equinoctial Bears affords a further strikingly distinctive character. In the former it amounts to one sixth part of the entire length of the animal; in the latter it constitutes about one tenth part in the hind foot, and somewhat less in the anterior one. The Polar Bear is remarkable on account of the length of the body, and the comparative smallness of the claws: in the *Helarctos* the body is stout and well proportioned, the legs are short, but the claws are of excessive length.

Among the characters which distinguish the *Helarctos* not only from the Polar Bear but from all other *Ursi* hitherto discovered, are to be mentioned the shortness and smoothness of the fur, the length of the tongue, and the disposition of the teeth. In confirmation of what I have said already of the latter, I shall give the following extract from M. Cuvier's remarks. Speaking of the grinders of the Bears in general, he says, "Par une disposition

toute contraire je trouve que dans l'ours de Java les grosses molaires se rapprochent tellement de la canine qu'il n'y a point d'espace vide ; celle qui est la première des quatre en série s'y trouve même extrêmement petite à la machoire supérieure, tant elle y est comprimée entre celle de derrière la canine et la carnassière." But the Polar Bear and the *Helarctos* are as much distinguished by their manners and disposition as by their organization. It is not however my intention to contrast them at present in all points of view ; to exhibit fully the peculiarities of each would afford matter for very ample details. The Polar Bear lives in the most distant regions of the North, near the ocean, among ice and tempests. Its food is exclusively of an animal nature, and is supplied by fishes, seals, and the carcasses of whales. It passes more than half the year in a torpid state, and when it awakes exhibits an unconquerable ferocity of disposition. Although repeatedly taken in a young state, no individual has ever been even partially domesticated. The voyages to the Northern regions abound with accounts of its courage and fierceness. It has often been found a dangerous and destructive enemy to man. The *Helarctos* on the contrary, inhabits the most delightful and fertile regions of the globe. The range both of the Malayan and Bornean species appears to be limited to within a few degrees of the equator, and it is therefore with propriety designated as the Equinoctial Bear. Its food is almost exclusively vegetable, and it is often attracted to the society of man, by its fondness for the young protruding summits of the cocoanut trees. It appears therefore not unfrequently at the villages, and has in many instances been taken and made to submit to the confinement of a domestic life. Whenever in the countries which it inhabits the natives change their residence, the cocoanut trees become the prize of the *Helarctos*. In one of his excursions through the Passumah district of Sumatra, Sir Stamford Raffles found the cocoanut trees of deserted villages destroyed by the Malayan Bear. It is well known to be fond of delicacies. In its native forests, its lengthened tongue fits it peculiarly for feeding on honey, which is abundantly supplied by various indigenous species of Bees. The sagacity it displays in confinement, shews that its manners in a

state of nature would afford a subject for much interesting observation.

I have only to add the following characters of the subgenus and of the species :

CHAR. SUBGEN.—*Dentes primores et laniarii* iidem qui aliis hujus generis speciebus.

Nota! Nomen *Ursus* genus omne designat, in quo Cel. Cuvieri discrimine, variæ structura formæ complectuntur ; in illis formæ *HELARCTOS* typum exhibet.

Molares supra utrinsecus quinque : tres anteriores unicuspides ; primus majusculus laniariis approximatus, secundus minimus occultatus, tertius mediocris ; quartus et quintus tritorii, coronidibus oblongis compressis tuberculatis, magnitudine reliquis hujus generis speciebus vix æquantibus. Infra utrinsecus quinque ; anteriores tres unicuspides, duo posteriores tuberculati, oblongi, magni.

Caput calvaria dilatato-globosa, tumida, parietibus lateralibus patentibus, subdivergentibus, fronte subobliquo, vertice antice arcuato, rotundato, summo lato. *Vultus* orbiculatus, amplus, pilis rarioribus adpersus. *Rostrum* breve, capite abrupte appositum.

Nasus oblongus, mediocris ; *rhinario* alto cartilagineo, elongato, oblique truncato, submobili, utrinque rima laterali basali. *Nares* ovatae, antice spectantes, septo compresso divisæ, lateribus rima laterali rhinarii patulæ. *Labrum* laxum, amplum, protensile, intus rugosissimum. *Labium* breve subcoarctatum, labro absconditum. *Oculi* parvi, antice prope basin rostri siti. *Aures* in calvariâ parte posteriore dispositæ, parvæ, postice spectantes, basi pilis densis obsitæ, margine nudiusculo, pilis sericeis discoloribus cincto ; ab oculis intervallo maximo distantes. *Lingua* gracilis, longissima, extensilis basi papillis planis compressis obsita, apice lævâ.

Corpus cylindraceum obesum, nuchâ dorsoque latissimis ; vellere brevissimo, nitido, molliusculo. *Cauda* brevissima. *Mammæ* apertæ quatuor, duo pectorales duo ventrales.

Pedes validi. Digiti compressissimi. Plantæ breves, callosæ. Ungues falculares, graciles, fortiter arcuati, transverse truncati, antici validiores longiores. Incessus plantigradus, pedibus anterioribus introrsum versis.

Spec. I. HELARCTOS MALAYANUS.

H. ater, pectore maculâ semilunari albâ.

Bruang of the Malays.

Ursus Malayanus, Raffles, Trans Linn. Soc.

Ursus Malayanus, Horsf. Zool. Researches.

Ours des Malais, Fréd. Cuv. Hist. Nat. des Mammifères, Livr. 47.

Spec. II. HELARCTOS EURYSPIUS.

H. ater, pectore plagâ amplâ aurantiâ supernè profundè emarginatâ, pedibus fasciâ transversâ cinereâ.

Tab. Supp. XI.

London, June, 1825.

ART. XXVI. *Descriptions of some rare, interesting, or hitherto uncharacterized Subjects in Zoology. By N. A. VIGORS, jun. Esq. M.A. F.L.S.; with Figures by J. DE CARLE SOWERBY, Esq. F.L.S.*

[Continued from Vol. I. p. 542.]

Subreg. VERTEBRATA. Auct.
Classis. AVES. Auct.
Ordo. GRALLATORES. Ill.
Fam. GRUIDÆ.
Genus. ANTHROPOIDES. Vieill.

STANLEYANUS. *A. cæruleo-griseus, vertice albido, taniâ postoculari fuscâ, pteromatibus, remigum apicibus, caudâque fusco-nigris.*

Tab. VIII.

Rostrum pallidé rubrum. *Caput* tumidum, plumis mollibus. *Caudæ*, *remigum*, *scapularium*, *pectorisque* plumæ apice acuto, hujus longæ dependentes. *Remiges* secundariæ longissimæ. *Irides* castaneo-nigræ. Longitudo *corporis* ab apice rostri ad apicem caudæ, 3 Ped., 6; *alæ* a carpo ad remigem 3^{um}, 1 Pes, 9; *caudæ*, 9; *rostri*, 4; *tarsi*, 8.

Habitat in Iudiâ Orientali.

Viri Illustrissimi EDOUARDI BARONIS STANLEY, Societatis Linneanæ Pro-Præsidis, scientiæ Ornithologicæ peritissimi, et Musei Zoologici longé latèque celeberrimi digni possessoris, hæc nobilis speciosissimaque avis nomine honoretur.

The genus *Anthropoides* of M. Vieillot, hitherto limited to the two Linnean species of *Ardea*, the *A. pavonina*, and *A. Virgo*, receives a signal addition in this noble species. The bird from which our figure and description have been taken is now alive in the Menagerie at the Tower; and forms one of the most interesting objects of that collection, which is at present particularly rich in rare and valuable animals. We are indebted for the liberty of describing it to the kindness of Mr. Cops, the keeper of the collection, to whose singular attention and intelligence in performing the duties of his office, we beg leave to bear our ready and cordial testimony. The species is closely allied to the *Anthropoides Virgo*, Vieill., and by casual observers indeed has been considered a variety of that bird. Its general form and the disposition of its colours are nearly the same. But it is much taller than the *Demoiselle*, has a different appearance about the head, the feathers of which are close and soft, and seem as if swelled out into a kind of puff; and it is devoid of those tufts, which rise from each side of the head of the Numidian bird. The secondary quill feathers also appear considerably longer: one of these which I measured extended above a yard in length, and must originally have been longer, as the ends of all these feathers were much worn and broken. The same feathers in the *Anth. Virgo*, although much longer than in most birds, are not above one third of that length; as far at least as I can determine from the examination of only one specimen, which is in the British

Museum. There are partial differences also in some other material particulars, on which I do not wish at present to dwell ; as from my not having had the opportunity of comparing the two species at once together, I of course cannot venture to detail such characters with accuracy. I shall only mention the greater length and developement of the *hallux* in *Anth. Stanleyanus* ; in which character that bird seems to be intermediate between *Anth. Virgo*, and the more typical *Gruidæ*. *Anth. pavoninus* accords with our bird in this particular, and by the additional character of the naked cheeks and caruncle under the chin seems to exhibit a still nearer approach to the true *Grus*. *Anth. Virgo*, on the other hand, by the slight developement of the *hallux* appears to possess the nearest affinity of all the birds in the group to the three-toed family of *Charadriadæ*, which adjoins it in the present Order.

In manners and gestures the *Anth. Stanleyanus* appears to conform most intimately with the *Demoiselle* ; displaying the same delicacy and elegance of attitude, and the same majesty, together with the same graceful playfulness in all its movements. I once had the good fortune to see it when released from the place of its confinement and set at liberty into an adjoining yard ; and it was scarcely possible to witness a scene of more grace and animation. The bird, when after a few movements it felt itself free, bounded into the air, and traversed the yard with singular velocity, and a peculiarity of motion which could neither be termed running nor flying : with its wings expanded and its long quill feathers streaming just above the ground, it sailed and swept along the open space, without regard to the numerous spectators who watched its movements, luxuriating in all the buoyancy and ex-cursiveness of new-felt liberty, I understand that it is particularly eager in its pursuit after insects which it takes when they are upon the wing ; and that they seem to be its natural and most acceptable food. We may readily conceive what myriads of winged creatures it would encircle within its wings as it swept along its native marshes, in the manner observed above, and which it would thus bring within the compass of its prey.

Subreg.	ANNULOSA.
Classis.	MANDIBULATA. MacL.
Ordo.	COLEOPTERA. Linn.
Trib.	LAMELLICORNES. Lat.
Stirps.	PETALOCERA THALEROPHAGA. MacL.
Fam.	CETONIADÆ. MacL.
Genus.	CETONIA. Fab.

CURTISII. *C. atra*, thorace vittâ laterali albidâ, scapulis elytrisque rufis, his maculâ basali fasciâque apicali irregularibus nigris.

Tab. IX. f. 1.

Clypeus, thorax pedesque punctis impressi; *Abdominis* segmenta punctis lineatim dispositis impressa. *Pectus*, corpus supra, pedesque ferrugineo-pilosi. *Elytra* longitudinaliter obsolete sulcata, sulcis prope basin punctis impressis.

Long. corp. $\frac{1}{2}$ l. lat. $\frac{1}{3}$ l.

Habitat in Africâ Meridionali.

In Mus. Dom. Curtis, Bennett, nost.

Domino JOANNI CURTIS, Societatis Linneanæ Socio, Insularum Britannicarum Entomologiæ assiduo indagatori, eximioque illustratori, hanc speciem, quam, inter plures alias Africæ meridionali proprias, liberalitati ejus debeo, grato animo dedicavi.

This insect accords very closely with Olivier's description of *C. equinoctialis*, which is a Senegal species: but it differs from it in having no white point near the apex of the *elytra*, a distinguishing character in the latter insect.

FLAMMEA. *C. atra*, scapulis elytrisque flammeo-rubris, his fasciâ apicali nigrâ, fasciisque humerali mediâque interruptis nigro-brunneis.

Tab. IX. f. 2.

Thorax, *pectus*, *clypeus*, pedesque punctis impressi. *Abdominis* segmenta punctis lineatim dispositis impressa. *Pedes* ferrugineo-pilosi. *Elytra* prope suturam sulcis tribus longitudinalibus instructa.

Long. corp. $\frac{4}{18}$. Lat. $\frac{1}{18}$.

Habitat in Africâ meridionali.

In Mus. Dom. Curtis, Bennett, nost.

An *Cetonia sanguinolenta*, Oliv. Ins. 1. 6. 49. 59. tab. 6. f. 41?

ALBO-GUTTATA. *C. nigro-viridis, albo-guttata, scapulis albis, antennis tarsisque nigris.*

Tab. IX. f. 3.

Clypeus punctis impressus, maculis quatuor albis notatus, anterioribus oblongis, posterioribus subrotundatis. *Thorax* leviter punctis impressus, maculis decem, tribus utrinque lateralibus subovalibus, quatuor mediis rotundis notatus. *Elytra* posticé mucronata, in medio longitudinaliter carinata, punctis longitudinaliter dispositis impressa: maculis septem albis subrotundis, quatuor suturalibus, tribus lateralibus notata, harum mediâ grandiori. *Abdomen* supra nigrum, segmento ultimo nigro-viridi, scabroso, maculis duabus grandibus, alterisque minimis, albis, notato; subtus nitidum, parcé punctis impressum, segmento primo maculis tribus, secundo et tertio quinque, quarto quatuor, quintoque duabus grandibus, notatis. *Pectus* nitidissimum parcé punctis impressum, maculis quatuor albis, unâ utrinque scapulari irregulari, duabusque mediis rotundis parvis, notatum. *Pedes* punctis impressi, pilis ferrugineis confertis intus ciliati.

Long. corp. $\frac{11}{18}$ ad $\frac{7}{8}$. Lat. $\frac{3}{18}$ ad $\frac{4}{18}$.

Habitat in Maderaspatanâ.

In Mus. Dom. MacLeay, nost.

ARBORESCENS. *C. atra, thorace rufo medio scutelloque nigris, elytris rufis, maculâ basali irregulari, mediâ subrotundatâ reniformi, lineâque suturali apicalique nigris.*

Tab. IX. f. 4.

Caput punctis impressum. *Thorax* glaber disco postico nigro. *Elytra* vix sulcata, sulcis punctis impressis; maculis lineisque nigris, cum elytra claudentur, arboris figuram quodammodo fingentibus. *Abdomen* supra nigrum, segmento ultimo fasciâ mediâ

lunulari flavescente notato: subtus glabrum, nitidum, segmentis 2^{do} ad 5^{um} inclusum maculâ flavescente utrinque notatis. *Corpus pedesque* parcè punctis impressi, ferrugineisque pilis instructi.

Long. corp. $\frac{3}{4}$. Lat. $\frac{1}{8}$.

Habitat —?

In Mus. Dom. MacLeay, nost.

Tribus. CAPRICORNES. Lat.

Genus. LAMIA. Fab.

SCUTIGERA. *L. rufa, elytris ochraceo-brunneis, lineâ marginali suturalique, fasciâque humerali connectente, albis, antennis nigris articulis duobus primis rufis.*

Tab. IX. f. 5.

Corpus, elytra, pedesque tomentosi. *Mandibulæ* rufæ apice nigro. *Antennarum* articuli duo primi rufi, tertius niger apice rufo, cæteris nigris. *Thorax elytraque* leviter punctati, horum lineis fasciisque e pilis albidis compositis, elytris clausis, similitudinem clypei ex vero experimentibus.

Long. corp. $\frac{1}{2}$. Lat. $\frac{1}{4}$.

Habitat in Brasiliâ.

In Mus. Dom. MacLeay, nost.

This species, with *L. V notata* and *L. perpulchra*, described in this Journal,* which are also Brazilian insects, form a small natural group.

VIDUA. *L. atra, pilis albidis variegata, elytris albidè hirsutis, fascias tres undulatas subinterruptas maculasque parvas interjectas carinamque mediam longitudinalem nigras exhibentibus.*

Tab. IX. f. 6.

Caput atrum fronte piloso albo. *Thorax* vittâ laterali spinas includente, carinâque mediâ longitudinali, nigris, sed aliter pilis albidis opertus. *Antennarum* articuli, primo excepto, ad basin albidè pilosi. *Femora* ad basin albidè pilosa. *Tibiæ* medio pilis

* Vol. I. pp. 417, 418.

albidis annulatæ. *Tarsorum* articulus primus supra albidè pilosus.

Long. corp. $1\frac{1}{10}$ Lat. $\frac{5}{10}$.

Habitat in Brasiliâ.

In Mus. nost.

Fam. CASSIDIDÆ. MacL.

Genus. ALURNUS. Fab.

CORALLINUS. *A. corallino-ruber*, antennis, scutello, thoracis abdominisque infimi medio, tibiis, tarsisque nigris.

Tab. IX. f. 7.

Os nigrum. *Thorax* scabrosus, lineâ mediâ longitudinali nigrâ. *Elytra* scabrosissima ad margines parcè ferrugineo-hirsuta. *Femora* antica in medio rubra, basi apiceque nigris: cætera basi rubra apice nigro. *Abdomen* subtus pedesque nitidi, glabri, punctis parcè impressi. *Tarsi* subtus ferrugineo-pilosi.

Long corp. $\frac{17}{10}$. lat. $\frac{2}{5}$.

Habitat in Brasiliâ.

In Mus. nost.

Genus. CASSIDA. Linn.

SMARAGDINA. *C. splendente-viridis*, supra punctis profundè impressa, subtus glabra, nitida, thorace elytrisque aureo-marginatis.

Tab. IX. f. 8.

Elytra punctis mediis rotundis, marginalibus oblongis subovalibus, supra subtusque ad marginem spectantibus, impressa. *Tarsi* subtus pilis ferrugineis hirsuti.

Long. corp. $1\frac{3}{8}$. Lat. $\frac{1}{2}$.

Habitat in Brasiliâ.

In Mus. nost., multisque aliis.

METALLICA. *C. cupreo-viridis*, subgibbosa, supra punctis confertis profundè impressa, subtus glabra, leviter punctata, aureo-splendens.

Tab. IX. f. 9.

Antennæ, articulis sex primis nudis splendentibus, cæteris fer-

rugineo-pilosis. *Pedes* parcé hirsuti; *tarsis* pilis ferrugineis sub-
tus instructis.

Long. corp. $\frac{2}{3}$; Lat. $\frac{1}{2}$.

Habitat in Brasiliâ.

In Mus. Dom. MacLeay, nost.

ROSEO-CINCTA. *C. atra*, *pedibus thorace elytrisque flavis, his*
roseo-marginatis, maculisque duabus mediis nigris.

Tab. IX. f. 10.

Antennæ, articulis sex primis flavis, reliquis nigris. *Femora*
flava basi nigro. Thorax abdomenque glabri. Elytra punctis
impressa.

Long. corp. $\frac{1}{2}$. Lat. $\frac{2}{3}$.

Habitat in Brasiliâ.

In Mus. Dom. MacLeay, nost.

Fam. CLYTHRIDÆ. MacL.

Genus. CLYTHRA. Fab.

GIBBOSA. *C. atra*, *thorace elytrisque luteis nigro-maculatis, ho-*
rum lateribus paululum productis.

Tab. IX. f. 11.

Insectum inter *Clythram* et *Adorium* forsan ponendum.

Antennæ subpectinatæ, nigræ, articulis 2^{da} et 3^{ma} luteis. *Tho-*
rax fasciâ tridentatâ ad marginem posteriorem, maculisque duabus
mediis nigris, notatus. Elytra maculâ humerali, alterâque api-
cali, duabusque mediis subconfluentibus nigris notata. Caput
rugosulum. Thorax elytraque parcé punctis impressi. Corpus
pedesque tomentosi.

Long. corp. $\frac{3}{4}$. Lat. $\frac{1}{2}$.

Habitat in Maderaspatanâ.

In Mus. Dom. MacLeay, nost.

[To be continued].

ART. XXVII. *An Attempt at a division of the Family Vespertilionidæ into groups.* By JOHN EDWARD GRAY, Esq. F.G.S.

SEVERAL celebrated zoologists have paid considerable attention to Bats, and have separated them into many (29) Genera; but they have not attempted to place these genera into natural groups, or to point out the affinity which exists between each of them: to attempt the former is the object of this paper, the latter being left to a future opportunity.

Bats, or the Family *Vespertilionidæ*, may be divided into two sections, the former of which is the typical one, containing two, and the latter, the annectant, containing three groups; these, as they are divisions of a family, may be called subfamilies, and I shall adopt for them the termination which Mr. Vigors has used in his table of *Falconidæ* for similar divisions.

I. *The Bats furnished with leaf-like appendages on their noses. Grinding teeth acutely tubercular.* Istiophori, Spix.

Subfam. 1. PHYLLOSTOMINA.

The nose leaf simple, fleshy, solitary or twin; the index finger formed of two phalanges.

Genera. Phyllostoma, Glossophaga, Rhinopoma, and Vampyrus of Geoffroy, Arctibeus, Medateus, and Monophyllus, Leach, Diphylla, and Vampyrus of Spix; as the latter differs from Geoffroy's genus of that name I propose to call it Istiophorus.

Subfam. 2. RHINOLOPHINA.

The nose leaf complicated, membranous; the index finger of only one joint; the wings large and broad. The females have usually ventral as well as pectoral teats.*

Genera. Rhinolophus, Megaderma, and perhaps Nycteris, of Geoffroy, and the genera Nyctophilus and Mormoops of Leach.

II. *Bats destitute of any leaf-like appendages on their nose.* Anistiophori, Spix.

* I have observed two ventral or rather pubal teats in *Megaderma* Lyra.

Subfam. 3. VESPERTILIONINA.

The grinding teeth acutely tubercular; the wings large, broad, the index finger of only one joint. The head long, hairy; lips simple; tongue short; tail long.

Genera. *Vespertilio* of *Linnaeus*, *Plecotus* of *Geoffroy*, *Thyroptera* of *Spix*, and the new genus *Barbastellus*.

Thyroptera is exceedingly curious, as the thumb of the wing is provided with a cap-shaped appendage, which is doubtless used for the purpose of attaching the animals by the pressure of the atmosphere to polished surfaces, in a similar manner to flies, &c. &c. although *Spix* does not take any notice of the subject.

The genus *Barbastellus* (*Vespertilio Barbastellus* Linn.) is characterized by its teeth, and by a lozenge-shaped bald place on its forehead, surrounded by a membranous edge. It appears to unite the *Plecoti* with the former subfamily.

Subfam. 4. NOCTILIONINA.

The grinding teeth actually tubercular; the wings long, narrow; the index finger of two joints; the head short, blunt; lips very large; tail encurved. The female often furnished with lateral nursing pouches formed by the wings.

Genera. *Noctilio* of *Linnaeus*. *Molossus*, *Nyctinomus*, *Thyopterus*, and perhaps *Stenoderma* of *Geoffroy*; *Scotophylus*, *Celano*, and *Aëlo* of *Dr. Leach*; *Cheiromeles* of *Dr. Horsfield*, and *Proboscidea* of *Spix*, belong to this subfamily.

Subfam. 5. PTEROPINA.

The grinding teeth bluntly tubercular, the wings conical; (interfemoral membrane and tail mostly wanting). The index finger with three bony joints, clawed; the head long, hairy: the females sometimes furnished with nursing pouches.

The *Genera* *Pteropus* and *Cephalotes* of *Geoffroy*, and *Cynopterus* and *Macroglossus* of *F. Cuvier*, are referable to this subfamily.

Macroglossus has an affinity by its tongue and habits to *Glossophaga* of the former groups, and *Cynopterus* is allied to those genera of the *Phyllostomina*, which have only operculated nostrils. Thus the Bats appear to assume a circular disposition, similar to that pointed out by Mr. Vigors in Birds, and Mr. MacLeay in Insects.

ART. XXVIII. On a new Genus of Cirripedes. By G. B. SOWERBY, Esq. F.L.S., &c.

OCTOMERIS.

Testa subconica, valvis octo, inæqualibus, lateraliter conferruminatis, composita; apice pervio, basi adhærente (*valvâ testaceâ clausâ?*) Operculum bipartitum, valvis quatuor compositum, anticis majoribus.

It may, perhaps, be interesting to our readers to trace with us the history of our knowledge of the singular class of animals to which the present new Genus belongs: thus if we begin with the Linnean System, where the entire class forms but one Genus under the name of *Lepas*, we must be convinced of the truly natural character of the Genus, as well as of the finely arranged views of that Father of Natural History as a science. The Linnean *Lepas* was by Bruguières divided into two genera, under the appellations of *Balanus* and *Anatifa* (rightly *Anatifera*), which divisions correspond exactly with those of Lamarck, which he designates by the terms *Cirripèdes sessiles* et *Cirripèdes pédunculées*. We shall, however, find that our countryman, Leach, has been the first to define in an able manner the genera into which the family should be divided: having, in the first instance, formed the two primary divisions of *sessile* and *pedunculated*, under the terms *Campylosomata* and *Acamptosomata*, he divided the former into *Balanus*, *Acasta*, *Creusia*, *Pyrgoma*, *Clitia*, *Tubicinella*, *Coronula*, *Chelonobia*, *Conia*, &c.; and the latter into *Pentalasmis* (the same as *Anatifa*, Brug.) *Pollicipes*, *Scalpellum*, *Otion*, *Cineras*, and others.* Not, however, finding these divisions to be sufficient, he has in manuscript, on the boards of the collection at the British Museum, proposed several other genera, which, as he has not any where given the characters of them, we cannot further enter upon. We would only observe, that M. Ranzani, in his *Mem. di Storia Naturale*, proposes a new division of the family, separating the *Balanidæ* from the *Pentalasmidæ*, and giving the characters of the following genera, as forming the family of *Balanidæ*: 1st. *Asemus* (the same as *Conia* of Leach, *Polytréma*, De Ferussac, and *Tetraclita* of Schumacher, according to De Ferussac.) 2nd, *Ochthosia*, (the same as *Clitia*,

* See p. 203, of the present Number.

Leach, Verruca, *Schumacher*, and *Creusia Verruca*, *Lamarck*.) 3rd, *Balanus*, (*Balanus verus Auctorum*.) 4th, *Chthalamus*, (probably the same as a part of *Leach's Coniæ*.) 5th, *Coronula*, (the same as *Chlelonobia*, *Leach*, and *Coronula Testudinaria* of *Lamarck*.) 6th, *Cetopirus*, (*Coronula Balænaris*, *Lamarck*.) 7th, *Diadema*, (*Coronula Diadema*, *Lamarck*.) 8th, *Tubicinella* (*Lamarck*.) So that *M. Ranzani* has not actually proposed any new Genus, but has only elevated several *Lamarckian* species to the rank of genera. In the course of our work on the "Genera of Recent and Fossil Shells," we have established one most distinct Genus of the family of *Pentalasmidæ*, namely *Lithotrya*, and we now propose to establish another, and a most distinct Genus of *Balanidæ*. It is well known, that in the Genus *Balanus* of all authors, the shell consists of six pieces united together laterally to form the cone surrounding the animal and operculum. The Genus *Octomeris*, however, as its name implies, consists of eight pieces united in the same manner, to form the surrounding cone: its resemblance to *Balanus* will render it unnecessary for us to describe anything more than the characters in which it differs from that Genus; which are—first, the character we have already mentioned; secondly, the angular internal sutures of the valves; thirdly, the foliaceous structure of all the shelly parts; fourthly, the want of an internal plate; and, lastly, a thin epidermis, which appears constantly to cover this shell in its natural state, though seldom observable, because the specimens are frequently covered with foreign substances. The deeply sinuated and variously figured edges of the base cannot, in our opinion, be considered as an essential character of the Genus; but we think it probable that this Genus has no shelly base, though we have never seen any specimen attached to the rock.

We have given representations in our plate of the only species we have seen of this Genus, which we have lately received from the Cape of Good Hope, and named *Octomeris angulosa*.

Icon. Tab. nost. Suppl. XII.

Fig. 1. The outside.

2. The inside, showing the eight divisions.

3. The anterior piece.

4. The posterior piece.

5. to 10. The lateral pieces, three on each side.

11. The operculum, consisting of four pieces of which the two anterior are the larger.

ART. XXIX. *Analytical Notices of Books.*

Animalia Nova, sive Species Novæ Testudinum et Ranarum quas in itinere per Brasiliam, &c. collegit et descripsit Dr. J. B. DE SPIX. 4to. pp. 53. tabb. xvii. & xxii. Monachii. 1824.

THE number of new species of Testudinous Animals described in the present work amounts in the whole to eighteen, eleven of which are referred to the genus *Emys*, one to that of *Chelys* (*Matamata*, Merrem), two to *Kinosternon* N. G., and the remaining four to that of *Testudo*. The characters of *Kinosternon*, which appears to have been formed with the view of comprehending the Box Tortoises, the *Terrapena* of Merrem, are as follows :

Structura Emydis, pectore modo cataphracto; maxillis et capite supra inter oculos nudo squamosis; rostro pernasuto; oculis minus approximatis; gulâ subtus multicirrhosâ; caudâ apice unguiculatâ; bracteis pectoris undecim, illis pectus inter et testam interjacentibus non connatis; palpebris transversis.

In the Frogs the number of new species collected is yet more considerable. They consist of eleven species of the genus *Rana*, twenty-three of *Hyla*, twelve of *Bufo*, six of *Oxyrynchus* N. G., and one *Pipa*; in all fifty-three: a most important acquisition indeed, when we consider that the whole number of these animals described by Merrem does not exceed seventy-one. The following are the characters by which M. Spix distinguishes his genus *Oxyrynchus*.

Corpore bufonino, non verrucoso sed granuloso; capite brevi, acutè rostrato; maxillâ superiore ponè angulato-elevatâ; femoribus cum lumbis connatis; parotidibus exiguis, vix conspicuis.

Serpentum Brasiliensium Species Novæ ; ou Histoire Naturelle des Espèces nouvelles de Serpens recueillies, &c. Publiée par JEAN DE SPIX. Ecrite d'après les Notes du Voyageur, par JEAN WAGLER. Munich. 1824. 4to. pp. viii. & 75. tabb. xxvi.

THE laudable zeal and activity displayed by M. Spix, in laying before the scientific world the splendid results of his very interesting travels in the interior of Brazil, are deserving of our warmest thanks; and the work now under consideration is highly creditable to him, not merely in a scientific point of view, but also as evidencing his superiority to those feelings of personal jealousy and ambition by which naturalists, in common with other men, are too frequently influenced. Untainted by any such unworthy motive, and anxious to gratify, as speedily as possible, the expectations of zoologists, M. Spix has on this occasion called in to his assistance the pen of M. Wagler, a gentleman of whose scientific acquirements the proofs furnished in this production are highly satisfactory. To him we are indebted for the whole of the descriptions and observations, with the exception of those relative to the habits and localities of the respective species, which were supplied by the distinguished traveller whose collection it is his object to illustrate.

Of one hundred species of serpents collected by M. Spix during his journey, no less than forty-three are entirely new; and of these, six are referable to the genus *Elaps*, one to *Dryinus*, seventeen to *Natrix*, three to *Xiphosoma* N. G., one to *Ophis* N. G., one to *Micrurus* N. G., eight to *Bothrops*, one to *Crotalus*, one to *Stenostoma*, (*Typhlops*, Schneider) one to *Leposternon* N. G., two to *Amphisbæna*, and one to *Cæcilia*. The first of these genera has been removed by M. Wagler from among the venomous serpents, with which it had been associated by Daudin, and subsequently by Cuvier and Merrem, and placed among the innocuous ones in the family of *Ophidii*, v. *Colubri*, inasmuch as on a careful examination of numerous individuals of various species, he discovered that they were entirely destitute of poisonous fangs. The *E. Langsdorffii* alone is furnished with one longer tooth on each side of the upper jaw, which however does not appear to possess a poisonous character.

The new genus *Xiphosoma* is divided from the true *Boa*, being intended to comprise those species which are not furnished with a hook on each side the anus. It is also distinguished by its very compressed body, and by its large teeth slightly curved backwards, three or four of which are crowded together in front on each side of the jaws, resembling in form the fangs of the Vipers. The habits of this genus are also different from those of the *Boa*, as the species live almost constantly in the water or on aquatic shrubs; nor do they ever attain the immense size of those dreadful serpents.

The genus *Ophis*, belonging to the Viperine family, forms a transition from the innocuous to the poisonous serpents; closely resembling the former in appearance, but distinguished from them by a fang on each side of the upper jaw, between which is a series of small imperforate teeth. The single species is named *Ophis Merremii*: it feeds on toads, and the figure given of it whimsically enough represents it in the act of swallowing one, the hinder feet of which projecting from the mouth give it a singular appearance, and might at first view be mistaken for a part of the serpent itself.

Micrurus, a new genus forming part of the section *Hydrini*, has a very great analogy to *Elaps*, but is venomous. Its characters are "Tail very short, rather acute at the apex; scuta of the tail beneath partly entire and partly divided; head indistinct, obtuse, with nine scuta above."

The remaining genus established by M. Wagler, *Leposternon*, is extremely interesting as presenting a connecting or osculant group between the two grand divisions of Reptiles proposed by Merrem, the *Pholidota* and the *Batrachia*. In every respect it coincides with the serpentine group of the latter, except in its sternum being covered with scuta, a structure which closely connects it with the true serpents included in the former section. The only species, *Leposternon microcephalum*, is described after a single specimen found in the neighbourhood of Rio de Janeiro. Its appearance and habits are very similar to those of the *Amphisbæna*.

Tableau des Corps Organisés Fossiles &c. A Table of Fossil Organic Bodies, preceded by Remarks on their Petrification. By M. DEFRANCE. Paris, 1824. 8vo. pp. xvi & 136.

THE splendid collection of fossils possessed by M. DeFrance, has long been acknowledged to be unrivalled in richness and extent, and hopes have been repeatedly expressed that the vast body of information contained in its ample stores would be laid before the scientific world by its liberal owner. Though repeatedly urged, however, by his friends, to publish a scientific catalogue of the numerous organic remains which it embraces, no attempt of this nature has been made, until the appearance of the present *brochure*, which we are desirous of hailing as the forerunner of a more important work, (although no such hint is contained in it,) to which it would form an excellent introduction. The "Remarks on Petrification" consist of a series of geological axioms, developing numerous novel and important facts, many of which will be found extremely interesting to the geologist. Among these may be mentioned the curious circumstance that the shells of certain families of *Mollusca*, the *Ostraceæ* for instance, never disappear in a fossil state, while those of others, as the *Volutæ*, *Cyprææ*, &c. are scarcely ever to be met with, casts or moulds of these alone being in general found. A striking distinction would thus seem to be drawn between the loose and foliated texture of the former and the more compact one of the latter, which is singularly supported by what takes place with respect to fossil shells of the genus *Hippomyx*. When these are fossilized in those strata in which the shelly matter generally disappears, their upper or patelliform part is always lost, nothing remaining but its mould, while their support, the structure of which is foliated, remains untouched, except in the point of attachment of the adductor muscle, which being equally compact with the upper portion of the shell, disappears in a similar manner.

The "Table" which occupies twenty eight pages, is so arranged as to present at one view the whole of the genera of Invertebrated Animals possessing or secreting calcareous matter: distinguishing those the species of which are found only in the living

state, both living and fossil, and fossil alone; and pointing out the strata in which the fossils are met with, whether anterior to chalk, in chalk, or posterior to it. Other columns enumerate the number of living, and of fossil species, respectively, of each genus; and notices are appended where any of these are either identical, analogous, or subanalogous. In the Vertebrata, only those genera are referred to which contain fossil species; and the same plan is pursued in Insects and in Vegetables. From these tables many curious results may be deduced, as well with respect to the relative proportion of the number of fossil to that of living species, as to that which exists between the remains of various families to be met with in the different strata. Thus of Mammalia, none have yet been discovered except in formations later than chalk; while Reptiles and Fish are found not only in these, but also in chalk, and in strata anterior to it. The number of species of shells existing in the living state is enumerated at 3080, while that of the fossil ones amounts to 2776; 64 of which only are referred to as identical, and 236 as analogous. The number of living univalves exceeds considerably that of the fossil, and these are chiefly to be met with in the later formations; a disposition which is reversed in the bivalves, where the fossil species are in greater number than the living, and a very large proportion are found in the earlier strata. These are also numerous in the chalk formations, which contain species of 25 genera of bivalves; while only four species of univalves have hitherto been discovered in them; a discrepancy which seems worthy of particular remark.

To enter at any length into the numerous other points comprised in this very interesting publication, would lead us into a detail unfitted for our more immediate province. Enough however has been stated in touching even thus slightly on a few of them, to induce all who feel an interest in its subject to desire a more intimate acquaintance with its contents. To say that these are worthy of the pen of its enlightened author, is at once to characterize them sufficiently.

Icones Fossilium Sectiles. Centuria Prima. fol. London. 1825.

For this excellent commencement of an attempt to delineate, in a cheap but not inelegant form, the whole of the species of organic fossil remains, we are indebted to a gentleman whose name does not appear in the title, but whose extensive acquirements in this department of science are devoted with zeal and perseverance to the investigation of the important national collection committed to his charge. His statements are consequently entitled to be received with much greater deference than might seem to be claimed by the unassuming nature of the publication, and will doubtless be authenticated with his name as soon as the work shall have enlarged into a volume; a step which is necessary not only to give authority to the various new genera and species contained in it, but also to secure to himself the just credit which will attach to his labours. He proposes to copy with accuracy, and in a style fully sufficient for scientific purposes, the best figures which have already been given, and to furnish original ones of such subjects as are hitherto unpublished. The number of these latter will consequently be very considerable, and if this first century can be taken as a specimen, will bear a very large proportion to the whole, as there are included in it no less than forty-three new species, for several of which it has been necessary to establish genera, to which characters are assigned. It is indeed to be regretted that characters have not been given in every instance, as well generic as specific, and especially to those species which are now for the first time made public; a deficiency which we hope to see supplied in the succeeding centuries, and that it will not be necessary to wait for the requisite information on these points until the appearance of the other work, which the author hints at his intention of publishing. It would also be well to add to those figures that are copied a reference to the works from whence they are taken. In the location of the figures, which comprehend examples both of animal and vegetable fossils, no system is followed, as they are designed to be subsequently cut out and arranged in the most convenient method.

The number of new genera is nine, including two which arise

from the dismemberment of the extensive group of *Terebratula*. They consist of one of Fishes under the name of *Teratichthys*, but the characters of this are not yet sufficiently recovered to establish the genus with accuracy: four of *Mollusca*, 1. *Pharetrium*, probably belonging to the *Pteropoda*, described as a "testaceous body, composed of two conical sheaths, one external, the other internal and perforated at its apex, united together near the margin of the mouth;" 2. *Leucophthalmus*, a genus of *Ascidia*, with the "body globose, coriaceous, pedicelled: apertures two, pentagonal, five-rayed;" 3. *Trigonotreta*, and 4. *Trigonosemus*, separated from *Terebratula*; a division necessitating the reformation of the characters of the latter genus, which is therefore confined to those species in which the rostrum of the produced valve is emarginate or subcanaliculate, and perforated at the apex; while in *Trigonotreta* this part is perforated, flattened, and subtriangular internally, and is also internally flattened in *Trigonosemus*, the flattened surface having a triangular mark, and the perforation being at the apex: a new genus of those very interesting fossils the *Trilobites*, *Homalonotus*, a name indicating its most distinguishing characteristic, the flatness of the back: and two genera of *Polypi*, 1. *Aspidiscus*, "orbicular, convex above, furnished with crenulate, unequal, decussating crests; beneath flat and marked with circular concentric striæ;" and 2. *Blumenbachium*, "globose, externally beset in every direction with stellulæ, which are prominent, generally four-rayed, frequently confluent, punctate-porous; internally cavernous, its substance fibrous-cellular." One other genus, *Spongius*, requires also to be mentioned, since the family of which it forms a part is generally admitted into the animal kingdom. It differs chiefly from *Spongia* in its texture, before it became fossilized, having been much more lax; in its more regular form; and in the evident traces which remain of its having possessed an evanescent epidermis.

Annales des Sciences Naturelles. Nos. xi. and xii.

In noticing briefly the leading zoological facts contained in the present numbers of this valuable periodical, an arrangement of the papers will be pursued corresponding with the location of their

subjects in the scale of animated nature. Commencing therefore with the Vertebrata, the first article which falls under our observation is "On the *Vespertiliones* of Brazil; by Isidore Geoffroy St. Hilaire;" and, singular to relate, the four species described in it appear all to be entirely distinct from any of the new Bats collected in the same country by the zealous traveller Spix, whose excellent work on this subject we have recently referred to.* Of these four species, three appertain to the genus *Vespertilio*, and the remaining one is referable to that of *Plecotus*. To the former are assigned the following characters.

V. Hilarii. Ears small, triangular, almost as broad as long, slightly notched at their external margin; body rather longer than the arm and fore-arm; tail as long only as the fore-arm; interfemoral membrane naked; sides of the face naked.

V. Polythrix. Ears rather small, longer than broad, notched at their external margin; body about as long as the arm and fore-arm; tail as long only as the fore-arm; interfemoral membrane covered in its upper part with scattered hairs; face almost entirely hairy.

V. levis. Ears long; body not so long as the arm and fore-arm; tail as long as the body; a few hairs on the interfemoral membrane; face partly naked.

	Length of the head and body. Eng. Inches.	Length of the tail. Eng. Inch.	Length of the fore-arm. Eng. Inches.	Distance between the extremities of the wings. Eng. Inches.
<i>V. Hilarii</i> . . .	2.633	1.925	1.729	12.733
<i>V. Polythrix</i> ..	2.200	1.572	1.493	9.982
<i>V. levis</i>	1.572	1.572	1.493	9.982

The first of these closely resembles the *V. Brasiliensis* of Desmarest, and is probably identical with that species; and the second appears to be that which has been termed the Brazilian Pipistrelle. The new species of *Plecotus*, *P. velatus*, is brown or chesnut coloured above, and brown with more or less of a greyish cast beneath; the length of its head and body is 2.986 English Inches, of the tail 1.925, of the fore-arm 1.729, and the distance

* See our last Number, p. 121.

between the extremities of the wings 12.733. It is chiefly remarkable inasmuch as its ears are incumbent on the face, an arrangement also met with in the *Nyctinomi* and *Molossi*, to which it approaches also in other respects. In his admeasurement it will have been remarked that M. I. St. Hilaire refers to the length of the fore-arm, which he justly considers as preferable to that of the ears, as not being liable like the latter to variations from drying. In this he had however been anticipated by Spix, whose dimensions extend also to several other parts, the relative proportions of which cannot fail to be highly serviceable in the discrimination of species.

The "Remarks on certain Sea Fish, and on their Geographical distribution, by MM. Quoy and Gaimard," may be regarded as consisting of two principal portions. In the first the authors undertake to combat several vulgarly received opinions relative to the Shark (*Squalus Carcharias*), a fish which they found to inhabit all the seas traversed in the course of their voyage. Thus it is erroneous to conceive that it is able to throw itself above the surface of the ocean to seize its prey, since the organization of its jaws and œsophagus prevents it from taking its food except while lying on its side or on its back. In these positions its muscular powers are quite insufficient to raise the considerable mass of fluid which presses not only on its body, but also on its immense pectoral fins; and this view of the subject is also confirmed by direct experiment, the most hungry Shark never having attempted to seize a piece of flesh presented to its notice at six inches above the surface. Neither will the authors allow it to be true that the Shark is able to bite off the leg of a man; against this the form and direction of the teeth militate strongly; and those instances in which the scattered members have been subsequently found, are regarded as resulting from their having been torn asunder by several of these animals pulling in contrary directions. In the second part, which relates more particularly to the geographical distribution of fishes, it is laid down as a general rule that, near the Equator, the species, in common with those of birds and insects, are of the most brilliant and vivid colours, which gradually disappear on proceeding towards the Poles; and this

principle is followed up at some detail in the enumeration of the genera according to the regions in which they are found. Contrary however to an opinion very frequently entertained, MM. Quoy and Gaimard declare that fishes do not swarm in the ocean, which possesses, like the land, its solitudes and deserts, inhabited only by those species which chiefly or entirely exist by prey.

In the "Sketch of a general distribution of the *Mollusca*, by M. Latreille," we are presented with the first fruits of the studies of this well-known Entomologist in those departments of natural science which have devolved upon him in consequence of the severe affliction of the veteran zoologist Lamarck. In this extract from an unpublished work on the "Natural Families of Animals," M. Latreille, proceeding on a principle frequently adopted by Cuvier, divides the *Mollusca* into *Phanerogama*, in which a coitus is necessary, and *Agama*, in which the individuals are capable of self-fecundation. The first of these is composed of the *Pterygiens* (comprehending the *Cephalopoda* and *Pteropoda*), and the *Apterygiens*, which include the whole of the *Gasteropoda*, with the exception of the *Scutibranches* and the *Cyclobranches*. The principal sections of the *Apterygiens* are also formed on a principle deduced from the generative faculty, being either Hermaphrodite, or Dioicous; each of which embraces various orders breathing free air, or furnished with branchiæ. In the formation of these the method of Lamarck is in general followed, although frequent variations are introduced in the mode of their arrangement, which concludes with the genus *Sigaretus*, the succeeding division commencing with *Halotis*. This division, or the *Agama*, also forms two sections, *Exocephala*, including the *Scutibranches* and *Cyclobranches*, and *Endocephala*, which is composed of two classes, the *Brachiopoda* and the *Conchifera* of Lamarck. The sections of the latter follow the anatomical method, and are the *Patulipalla*, *Biforipalla*, *Triforipalla*, and *Tubipalla*, the three former of which correspond with those of M. Cuvier, whose two other families are included in the last.

This distribution appears in many instances to succeed in pointing out affinities existing between the groups, but the principles on which it proceeds are too limited to lead to a truly natural

system, a desideratum only to be attained by a philosophical investigation of the organs in general.

Among the numerous researches into the Anatomy of this group of animals, which more enlightened views have determined to be essential to a correct knowledge of their distribution, it appears extraordinary that no dissection had been given of the *Calyptræa sinensis*, which inhabits the coasts of the very countries whose scientific naturalists were most deeply engaged in this pursuit. Such an inquiry seems indeed to have been especially called for since the period at which the genus was adopted by Lamarck as the type of a family, an eminence which it was reserved for M. Deshayes to prove its title to in his "Memoir on *Calyptræa*." In this, after a sketch of the history of the species above referred to, he proceeds to furnish a detailed account of its anatomy, illustrated by figures, which very nearly corresponds with that given by M. Cuvier of the neighbouring genus *Crepidula*, and sufficiently evinces the accuracy of its location, though previously founded on the characters of the shell alone.

Indebted as we are to the author of the preceding article for the information contained in it, we are sorry to have again to refer to him on the subject of his controversy with the Baron de Ferussac, who has observed that the *Neritæ* and *Naticæ* are referable to different families. This statement was controverted by M. Deshayes, who declared that, on actual examination of several species of *Natica*, he had seen that their eyes were placed on pedicles at the base of the tentacula, as in the animals of the genus *Nerita*. "If this be the case," observes M. de Ferussac, in his "Notice" on the subject, it proves that M. Deshayes has examined *Neritæ* alone," since Cuvier and Adanson both declare that the *Naticæ* have only two tentacula, at the base of which the eyes are situated.

Of the "Monograph of the genus *Eucnemis*, by the Baron de Mannerheim," and the "Extract from a letter to M. Henning on *Physodactylus*, by M. J. Fischer de Waldenheim," it is only necessary to mention the titles, as we purpose to give those articles in a future number. The only other entomological article is a "Report on Dalman's *Analecta Entomologica*, by M. Latreille,"

which enumerates the contents of that volume under the respective heads of monographs, new genera, and new species. The monographs are two in number; one of *Diopsis*, five species of which are described, from Sierra Leone; and the other of *Dryinus*, comprehending fourteen species. Of new genera there are nine; 1. *Thyrsia*, a genus allied to *Prionus*; 2. *Polytomus*, synonymous with *Rhipicera* of Latreille; 3. *Zirophorus*, a Staphylinid genus previously published by Germar under the name of *Leptochirus*; 4. *Hydroptila*, distinguished from *Phryganea* by its hinder wings, which are nearly linear, ciliate, and not plaited; 5. *Xyela* *; 6. *Dirrhinus*, and 7. *Agaon*, Hymenopterous genera of the family of *Pupivora*, to the first of which Latreille also refers the *Chalcis cornigera* of Jurine; 8. *Calyphus*, a singular genus of *Muscidæ* from the East Indies, the scutellum of which is prolonged over the abdomen as in *Scutellera*; and 9. *Chionea*, an apterous tipulideous insect, which is found running upon the snow in Sweden and also in the Alps. The new species described are chiefly Lepidopterous and Coleopterous. Of these fifteen are natives of Sweden and one hundred and five exotic.

To the remaining papers on zoological subjects it will only be necessary to refer, since they relate entirely to anatomical and physiological points, which, although of primary importance to the advancement of the science, are too generally unattractive to induce us to extend this analysis. Of these there are two from the pen of Geoffroy Saint-Hilaire, in one of which he pursues his system of the formation of the Cranium into the investigation of that of the Crocodile, and in the other endeavours to determine in man the position of "the Adgustal, one of the bones of the Arch of the Palate." The "Memoir on the Lymphatic Vessels of Birds, and on the method of preparing them, by M. E. A. Lauth," fully demonstrates their existence, and is illustrated by several well executed coloured plates; appended to it is the "Report" on its merits by Cuvier and Duméril, in which Majendie did not join, because although he admitted that the existence of absorbent vessels in the mesentery was demonstrated, he still persisted that it was by no means clear that they performed

* Vide Zoological Journal, Vol. I. p. 570

the functions of lacteals. The "Anatomical Researches on the Carabidæ and other coleopterous Insects, by Leon Dufour," are continued; as are also the "Remarks on the determination of the solid and nervous systems of articulated animals."

Annulosa Javanica, or an Attempt to illustrate the Natural Affinities and Analogies of the Insects collected in Java by T. HORSFIELD, M.D. &c. By W. S. MACLEAY, Esq. M.A. F.L.S. &c. No. i. pp. xii. and 50. pl. i.

DEEPLY indebted as we are, in common with all who admire the wonders of the creation, to that profound zoologist who has succeeded more effectually than any of his predecessors in unravelling the intricacies of the system pursued by Nature in the distribution of the animal kingdom, Mr. W. MacLeay has advanced still farther claims upon our gratitude in the excellent and purely scientific work the title of which is quoted above. To the more prominent features of the method which he has followed it is unnecessary at this advanced period of our acquaintance with it to advert particularly. Developed originally in that valuable production, the "*Horæ Entomologicæ*," of which by far the greater number of copies were unfortunately lost to the world, these were further explained in a communication to the Linnean Society, which has probably ere this passed through the hands of nearly the whole of our readers. The outlines of the system will therefore have become familiar to them, but they will have remarked that the attention of the expounder of these luminous views has hitherto been directed in general rather to the larger and more striking groups than to the minor divisions of families and genera. In the immense numerical extent of the insect tribes, and in the evidently inadequate acquaintance with them which we at present possess, sufficient reasons may at once be perceived to show the impossibility of immediately undertaking the stupendous task of comparing together the whole of them, and of thus elucidating throughout their respective affinities and analogies, so as to establish a completely natural system, at once perfect

and coherent in all its parts. This therefore Mr. MacLeay has refrained from attempting; but with the laudable desire of gratifying those who felt anxious to accompany him into greater detail than he had previously entered into, he has undertaken to describe the insects collected in Java by Dr. Horsfield, and which now form part of the collection of the East India Company, employing these as so many stations from which views may be obtained sufficient to furnish a competent idea of the ground plan of the whole.

In a masterly preface, after an exposition of the mode and the localities in which the collection was formed, and which render it a fair sample of the Entomology of Java, Mr. MacLeay proceeds to examine the advantages and defects to the scientific as well as the unscientific reader, of the various plans on which a descriptive catalogue of subjects of natural history may be formed, and assigns a deserved pre-eminence to that which is designed to supply such information as is calculated to lead the mind to a philosophical investigation of the science of Nature. It is this principle which he proposes to pursue in the progress of his work, this first number of which is devoted to that group of the *Coleoptera* which is distinguished by its chilopodiform larvæ. This is regarded as a Tribe, and the denomination of *Chilopodomorpha* is affixed to it, its characters being derived from the larva as well as the perfect insect, and laid down in the following terms: "*Larva* chilopodomorpha plerumque carnivora, corpore processibus duobus posticis styliformibus dorsalibus semper instructo: *Imago* plerumque pentamera, mandibulis corneis, maxillis bipartitis vel processibus duobus; laciniâ interiori in unguem corneum incurvum fere semper desinente; laciniâ exteriori sæpius biarticulatâ interdum palpiformi." From this definition it will be perceived that the internal maxillary palpus, as it is commonly termed, of the *Cicindelidæ*, *Carabidæ*, *Dytiscidæ*, and *Gyrinidæ*, is regarded as an external process of the maxilla, which, being in these families biarticulate, assumes a palpiform appearance; a view which is fully borne out by the admirable comparison of the parts of the mouth in winged insects instituted by Savigny.

The *Chilopodomorpha* are divisible into five stirpes, two of

which constitute a normal group, consisting of insects having linear or setaceous antennæ, with the exterior biarticulate process of the maxilla palpiform, and the other three forming an aberrant one, in which the antennæ are clavate, or at least gradually thickening towards the apex, while the external lobe of the maxilla is not palpiform. To the former, or normal group, which corresponds with the *Adephaga* of Clairville, are assigned, 1. the *Geodephaga*, the type of which is *Carabus*, and 2, the *Hydradephaga*, having for its type *Dytiscus*; while the latter, or aberrant, comprises, 3. the *Philhydrida*, typical example *Hydrophilus*; 4. *Necrophaga*, having *Silpha* for its type; and 5. *Brachelytra*, comprehending such insects as would have been included in the genus *Staphylinus*, Lin.

The names of the two stirpes of the normal group, *Geodephaga* and *Hydradephaga*, at once point out the prominent distinction between them, that the former is terrestrial and the latter aquatic; a difference of habit which of course implies a variation in the structure of the feet as designed for the respective purposes of walking or of swimming. The five families which compose the former of these, the *Geodephaga*, are the *Cicindelidæ*, *Carabidæ*, *Harpalidæ*, *Scaritidæ*, and *Brachinidæ*. No new form of *Cicindelidæ* occurs among the fourteen Javanese species described, all of which are referable to the genera *Colliuris*, *Therates*, or *Cicindela*. A new subgenus, *Lissauchenius*, is formed from one of the only two species of *Carabidæ* in the collection, the other being a *Panagæus*; but the deficiency in this family is amply compensated by the richness of the succeeding one, the *Harpalidæ*, no less than twenty-seven species of which are enumerated, comprehending among them twelve new forms, to which are assigned provisionally the ranks of genera or subgenera according to their apparent relative importance. The *Scaritidæ* are only three in number; and the *Brachinidæ* amount to ten species, two of which belong to subgenera not previously characterized, although a mere manuscript name had been affixed to one of them by the Baron Dejean.

The *Hydradephaga* are not only less numerous than the preceding stirps, to which they are connected by the intervention of

the genus *Omophron*, but are also less variable in form, the tropical species being usually referable to the same genera as the European. It has therefore been impracticable in the present state of entomological knowledge to exhibit clearly among them more than the two families of *Gyrinidæ* and *Dytiscidæ*; the former appertaining to the normal group, with long anterior legs and short antennæ, and the latter to the aberrant, in which the anterior legs are short and the antennæ setaceous. Three species of *Gyrinidæ*, one of which forms the new genus *Dineutus*, are found in the collection; together with eight species of *Dytiscidæ*.

The *Philhydrida*, between which and the preceding stirps an interesting link is supplied by *Spercheus*, is divided into the following families: normal? with the palpi shorter than the antennæ, *Heteroceridæ*?, *Parnidæ*: aberrant? palpi at least equal in length to the antennæ, *Helophoridæ*, *Hydrophilidæ*, and *Sphærididæ*?. Of the first and third of these families Dr. Horsfield has brought no specimen from Java; and of the second, only one species, which is however valuable as an addition to the single example previously known of the subgenus *Dryops*. Of *Hydrophilidæ* five species are described, all of which coincide with well known genera; as do also the two species of *Sphærididæ*. It will have been remarked that among the aquatic *Coleoptera*, only one new form has occurred in the collection.

To the normal? group of *Necrophaga*, in which the club of the antennæ is elongated, being composed of four or five joints, are assigned the *Scaphididæ* and *Silphidæ*; and to the aberrant?, with the club short and formed only of two or three joints?, the *Nitidulidæ*, *Engidæ*, and *Dermestidæ*. The connection of this with the former stirps is found between the last named family and the *Sphærididæ*. Of the *Scaphididæ* no example is found in Dr. Horsfield's collection, and there occurs only one of the *Silphidæ*, and one of the *Nitidulidæ*. In *Engidæ* it is much richer, comprising fifteen species, and including two new forms, as well as specimens of two established groups, *Engis* and *Colydium*, from which it has been found necessary to detach other genera. Of the *Dermestidæ* only two species are noticed, one of which, the *Dermestes vulpinus*, is remarkable for its ubiquity, and the other

is a new species of *Chelonarium*, a genus hitherto regarded as peculiar to America.

The fifth stirps, the *Brachelytra*, is connected with the preceding one through *Micropeplus*, (which is strongly allied to the *Nitidulidæ*;) and returns into the first by means of *Lesteva*, the *Carabus staphylinoides* of Marsham. The insects composing it are well known to be extremely rare in tropical climates, and we are therefore by no means surprised that Dr. Horsfield did not collect in Java a single insect referable to it; although the existence of such is most probable, since they have been brought both from the Continent of India, and from New Holland. Dr. Horsfield however conceives that if they had been to be found either in carrion or in flowers, they could scarcely have escaped his research. The arrangement of the families is nevertheless given in the following order: aberrant?, head not so broad as the thorax, 5. *Tachyporidaæ*, 4. *Pselaphidæ*, 3. *Omalidæ*; normal?, head as broad as the thorax, 2. *Stenidæ*, and 1. *Staphylinidæ*.

Having thus briefly adverted to some of the leading features of this truly scientific production, every page of which is pregnant with materials for thinking, scarcely less adapted to the general Zoologist than to the Entomologist in particular, it is almost unnecessary to add that we look forward with anxiety to the appearance of its future numbers.

*Transactions of the Linnean Society of London. Vol. xiv.
Part the third. 4to. pp. 395—605. Plates x.*

AT the commencement of an analysis of this, the concluding portion of the fourteenth volume of the Linnean Transactions, it is impossible to abstain from expressing the warmest pleasure at the important zoological character of its contents, which afford a gratifying prospect of the regeneration in this country of that science in which England formerly ranked high above all her rivals. The names of Lister, Ray, and Ellis, are deservedly estimated among us, but to those profound students of Nature there succeeded no one capable of maintaining the elevated station which

they occupied. During the latter part of the last century there existed indeed among us scarcely a single zoologist whose name will be recorded in the history of the science, as an active contributor to its advancement. But when, towards the close of that period, the Linnean Society, of which zoology formed one of the leading objects, became permanently organized, it had the effect of stimulating to exertion numerous individuals, well qualified to assist in extending our acquaintance with the animal kingdom. Particular instances require not to be pointed out, since the Transactions of that body exhibit among the contributors to them the names of all our later countrymen who possess claims on the gratitude of the student in this department of Natural History. Numerous however as their communications have continued to be, and highly valuable as has been the assistance afforded by many of them to the science they were designed to promote, Zoology has never formed, in any previous publication of the Society, so prominent a feature as in that which we have now to notice. This, in fact, with the exception of a single short paper by Mr. D. Don, is purely zoological throughout, and the subjects of which it treats are of the highest interest and importance. It is needless to allude to the circumstances which have mainly contributed to this gratifying result; they are too generally known to require enumeration; but we trust that those who possess the ability will still be induced to persevere with the same activity and zeal which they have now displayed, and that every succeeding part will thus be made to equal the present in zoological value; to exceed it, in a corresponding number of pages, would be extremely difficult.

The first, in point of order and of extent, of the papers contained in the present part, is from the pen of N. A. Vigors, Esq. It is entitled "Observations on the Natural Affinities that connect the Orders and Families of Birds;" and embraces an arrangement of the greater groups, together with a general view of the distribution of these into the minor divisions of tribes and families. With the outlines of the method pursued by this gentleman in his ornithological studies, the readers of the Zoological Journal are already well acquainted, from his various contributions

to our previous numbers, and particularly from his essay "On the Groups of the Falconidæ." Founded on the quinary distribution of Nature and circular succession of affinities first pointed out by Mr. W. MacLeay, and illustrated by him chiefly with reference to Insects, Mr. Vigors has carried this principle, which he here develops at considerable length, into the arrangement of Birds. Retaining four of the orders established by Linné, his Predaceous, Gallinaceous, Webfooted, and Wading Birds (to designate which, for the sake of referring to the same set of organs in the construction of the terms, as well as for uniformity of termination, he employs the names of Illiger, *Raptores*, *Rasores*, *Natatores*, and *Grallatores*,) he throws together the remaining two, the *Picæ* and *Passeres* of the great Swede, to form a fifth, under the names of *Insessores*, or Perching Birds. In this union he is supported by the authority of Cuvier, who has declared that he can discover no line of demarcation by which they can be separated into distinct orders.

Having thus laid down his five leading divisions, Mr. Vigors next proceeds to point out the chain of affinities by which these are connected together. Commencing with the *Raptores*, he finds in the genus *Strix* that inferior degree of organization and of strength which shows that it recedes farthest from the typical character of the order, and brings it into close approximation with *Caprimulgus*, an Insessorial genus, strikingly resembling it in manners, flight, and numerous other particulars. Between these genera a most beautiful link is supplied by the *Podargus* of Cuvier, which thus forms the immediate passage from the *Raptores* to the *Insessores*. To connect these latter with the *Rasores*, we have on the one hand the genera *Musophaga* and *Corythair*, already pointed out by Cuvier as uniting these two orders, and on the other the *Columbidæ*, which are referred by modern continental writers to the Gallinaceous Birds, although their affinity to the Perchers is so marked as to have induced Linné to arrange them among his *Passeres*. The passage from the *Rasores* to the *Grallatores* is formed by the *Cursores* of Illiger, which differ in fact from the Wading Birds in scarcely any other respect than their terrestrial habits, and which are met by the *Gruidæ*, a

family closely approximating in manners and in anatomy to the Gallinaceous group. Between the *Grallatores* and the *Natatores* it is almost unnecessary to point out any connecting link, since they approach each other by such gradations as to render it difficult to fix the exact limits of each. We may therefore pass on at once to the concluding link in this chain of affinities, which is one that it might appear almost impossible to supply. Nothing indeed can be more dissimilar than the habits of the *Natatores* and those of the *Raptores*; yet these it becomes necessary to unite in order that the circle may be completed. Frequenting different elements, and performing totally opposite functions in nature, the extreme discrepancy in the structure of their feet renders it difficult to conjecture how any modification of it can bring them into contact. Such a modification is however met with in the genus *Tachypetes*, Vieill., the *Pelecanus Aquilus*, Lin. Essentially natatorial in the character of its feet, their organization is so weakened and modified as to deprive it of the power of swimming; while its surprising strength and expansion of wing point it out as an inhabitant of the air. Attached exclusively to the ocean, on the surface of which it is, however, incapable of resting, it thus preserves some connexion with the element inhabited by the other *Natatores*, and is united to the *Raptores* by the predaceous habits which it pursues at immeasurable distances from the shore.

Into the next and most extensive portion of Mr. Vigors' enquiry, the arrangement and affinities of the minor groups of which his orders are composed, it would be impossible to follow him with sufficient detail to render our notice explanatory of his views; and we must therefore unwillingly confine ourselves to the mere enumeration of the tribes or families referable to each. The *Raptores* are perhaps less known than any other grand division of the class; the *Vulturidæ*, *Falconidæ*, and *Strigidæ*, being in fact the only families with which we are yet sufficiently acquainted; a fourth family will probably be supplied by the New World, which is known to possess Raptorial Birds that have not hitherto been properly described; and the fifth may be furnished by the *Gypogeranidæ*. The *Insessores*, exceeding considerably

in number and in variety of forms the other orders, embrace in consequence a greater number of families, which require therefore to be classed in the following tribes, *Fissirostres*, *Dentirostres*, *Conirostres*, *Scansores*, and *Tenuirostres*; each again comprising within itself a series of families the succession of which is developed in the clearest and most satisfactory manner. These we are reluctantly compelled to omit, together with the extremely interesting analogies deduced from them. The reader will however be well repaid for the most attentive perusal of the observations by which they are illustrated, and to which Mr. Vigors has devoted himself with an assiduity that cannot be too highly praised, drawing from numerous sources, and giving prominence to those facts which deserve especial notice. The *Rasores* are composed of the *Columbida*, *Phasianida*, *Tetraonida*, *Struthionida*, and *Cracida*; and to the *Grallatores*, the families of the *Gruida*, *Ardeida*, *Scolopacida*, *Rallida*, and *Charadriada*, are referred. The concluding order of *Natatores* embraces the *Anatida*, *Colymbida*, *Alcada*, *Pelecanida*, and *Larida*.

In this rapid enumeration of the groups, the text of Mr. Vigors' paper, in which the typical order, tribe, or family, is placed in the centre, has been followed for their arrangement. It may however be proper to add, that he has throughout appended in notes their distribution into normal and aberrant groups, on the principle more recently adopted by Mr. W. MacLeay; and that he has illustrated by diagrams the general affinities of the class, and also those of the *Insectorial* order.

In the course of his remarks on the distribution of the *Halcyonida*, Mr. Vigors has thought it necessary to assign a separate station to the Ternate Kingfisher, *Alcedo Dea*, Lin. This beautiful bird he has formed into a genus under the name of *Tanysiptera*, with the following character; "*Rostrum* sub-breve, sub-crassum, rectum, acutum, naribus ovalibus. *Cauda* gradata, rectricibus duabus longissimis." The wings and feet have not been referred to in this description, as the specimens which are brought to Europe are generally deprived of these members. He has also described a new species of *Buceros* from the interior of Africa, which is closely allied to *B. Abyssinicus*; but differs materially

from that bird in the structure of its bill. It is the *Buceros Leadbeateri*, "B. niger, remigibus primoribus albis; regione ophthalmicâ guttureque nudis coccineis, cœruleo-variegatis; rostri dorso elevato, cultrato, compresso."

To the same zealous and scientific ornithologist we are further indebted for the addition to the British Fauna of a new species of *Scolopax*, a single specimen of which was shot in the Queen's County, Ireland, in August, 1822, and which has since occurred once in England in the neighbourhood of Rochester. In "A description of a new species of *Scolopax* lately discovered in the British Islands: with observations on the *Anas glocitans* of Pallas, and a description of the female of that species; by N. A. Vigors, Esq.;" it is thus characterized; "*Scolopax Sabini*. S. castaneo atroque varia, subtus pallidior, pileo humeris pteromatibus remigibusque atris, rostro pedibusque fusco-atris." It differs from every other European species by the total absence of white from its plumage, as well as of those lighter tints of ferruginous-yellow which extend more or less in stripes along the head and back of them all. It also differs from all except *S. Gallinula* in the number of its tail-feathers, which amount to twelve. The *Anas glocitans*, referred by modern zoologists to the genus *Querquedula* of Brisson, is also extremely interesting to the British ornithologist from its having been quoted by Pennant as synonymous with his Bimaculated Duck. The male of this species was first described in the "British Zoology," from a specimen taken in 1771, but from no further account having been given of it, and as it has not been ascertained whether it was afterwards preserved, it has frequently been regarded as a doubtful native of our islands. Mr. Vigors has however in his possession specimens both of the male and female, which were taken in a decoy near Maldon, Essex, in the winter of 1812-13. These he has described, the latter for the first time, and has thus set at rest the question of the existence, as well as of the locality, of the species. In this, as in the former case, he has also pointed out the leading marks which distinguish it from the kindred species.

The "Descriptions of two species of Antelope from India, by Major General T. Hardwicke," are those of the *Antilope Goral*

and *A. Chickara*. The first of these is referable to the sub-genus *Cervicapra* of Desmarest, and is thus characterized; "*A. cornibus brevibus approximatis recurvis subulatis basi annulatis ultra medium lævibus, corpore supra colore murino canescente subtus pallidiore, gula albente, cauda brevi attenuata subfloccosa, oculis sinibus lacrymalibus.*" The second, which forms part of the genus *Tetracerus* of Leach, is also described; "*A. cornibus quatuor, anterioribus erectis cylindricis brevibus abrupte acuminatis basi subapproximatis, posterioribus subelongatis subulatis lævigatis rectis paululum divergentibus.*" An imperfect description and figure of this latter animal has been recently published in the *Histoire Naturelle des Mammifères*, on the authority of M. Devauzel, which there are strong grounds for believing were made up partly from memory, although M. D. asserts that he had in his own possession the living animals. Figures of the male Goral, and of the male and female Chickara, accompany General Hardwicke's paper.

From the same pen we are also furnished with two other articles; the one, a "Description of a new species of Tailed Bat, (*Tuphosous*, Geoff.) found in Calcutta," and the other a "Description of the *Buceros galeatus* from Malacca." The character of the new *Tuphosous*, *T. longimanus*, is thus given, "*T. supra ex fusco rufescens, subtus pallidior, trago plano capitulo securiformi obliquo margine crenulato, brachiis digitisque elongatis.*" The *Buceros galeatus* is described as "*B. niger, abdomine albo, rectricibus albido-flavescentibus fasciâ nigrâ, rostro conico subflavo; galeâ subquadrato-convexâ rubrâ fronte subflavâ.*" Figures of each of these animals are given in illustration of their descriptions. From the Extracts from the Minute Book given at the end of the Volume, we learn that the Society has also been indebted to General Hardwicke for a description of the *Cervus Pygargus*, an account of the *Ovis Argali*, and descriptions of the *Sciurus Petaurista*, the *Boa Phrygia*, and the *Buceros undulatus*.

Hitherto the Linnean Transactions have contained, with perhaps one solitary exception, no paper of the character of that by W. S. MacLeay, Esq. entitled "Anatomical Observations on the natural Group of Tunicata, with the Description of three Species

collected in Fox Channel during the late Northern Expedition." Re-urging the now almost undisputed position that zoology cannot be satisfactorily studied without comparative anatomy being taken for its basis, he proceeds to apply the aids to be thence derived to the illustration of this osculant group, between the polype *Acrita* and the Acephalous *Mollusca*. It would be difficult without the aid of the beautiful plates appended to his descriptions to convey an adequate idea of the species which he has dissected, the *Boltenia reniformis*, *Cystingia Griffithsii*, and *Dendrodoa glandaria*: for this we must therefore refer to the volume itself, contenting ourselves with extracting such portions of his arrangement as may furnish to those who study these animals a general view of his method of distributing them. He divides the *Tunicata* into an aberrant group? *Tethya*, and a normal one? *Thalida*. The first of these, in which the mantle adheres to the envelope or test only at its orifices, the branchial one being surrounded by a membranaceous ring, which is in general supplied with tentacula as in *Polypes*, comprises three families: 1. *Ascididæ*, Animals simple and fixed, having their orifices externally irregular; Generic Type, *Ascidia*: 2. *Botryllidæ*, Compound and fixed, having their orifices externally regular; Generic Type, *Polyclinum*: and 3. *Lucidæ*, Compound and floating, having their branchial cavity open at the two extremities; Generic Type, *Pyrosoma*. The second, or normal? group, in which the mantle adheres everywhere to the envelope, and the branchial orifice is provided merely with a valvule, contains only one family at present known, the *Biphoridæ*, of which *Salpa* forms the generic type; another family thus remaining to be discovered, and to reward the industry of the assiduous and qualified collector.

Considerable confusion having arisen in the application of the trivial names, *pedunculata*, *clavata*, and *globifera*, to the different species of *Ascidia* comprised in the genus *Boltenia*, Sav., Mr. MacLeay has given a synopsis of these. They are three in number, and are all peculiar to the Arctic Seas. From the synonyms appended to the species it appears that the *Boltenia ovifera* Sav. is the *Ascidia globifera* of Lamarck, and the *A. pedunculata* of Shaw and Bruguières; that the *B. fusiformis* Sav. is the *A. pedun-*

culata Lam., and the *A. clavata* of Shaw ; and that the *B. reniformis* MacL. is the *A. globifera* of Captain Sabine, and the *A. clavata* of Otho Fabricius, and also, according to him, of Müller.

The genus *Cystingia* is new. It agrees with *Boltenia* in the body being affixed by a pedicle, which however is very short, and in the tentacula of the branchial orifice being composite ; but it differs in the terminal position of the anal orifice, which is moreover irregular instead of quadrifid. It also differs in several anatomical characters, particularly in the indistinctness and irregularity of the reticulation of the branchial pouch.

Dendrodoa is also new. It forms a subgenus of *Ascidia*, which completes, with the four previously described by Savigny, the circular series of that group. It indeed beautifully connects together the three aberrant subgenera of *Ascidia*, one of which, *Styela*, possesses at least one ovary on each side of the body ; another, *Pandocia*, a single ovary, which is seated on the right side ; and the third, *Dendrodoa*, having also a single ovary, which however is placed on the left. *Dendrodoa* also returns into one of the normal subgenera, *Cynthia*, by the nature of its branchial reticulation and of its digestive apparatus.

It remains now to notice only one other paper, "A Description of such Genera and Species of Insects, alluded to in the "Introduction to Entomology" of Messrs. Kirby and Spence, as appear not to have been before sufficiently noticed or described : by the Rev. W. Kirby : Decade the first." In this, the able and veteran author describes several new genera, the whole of which, with one exception, are referable to the grand group of *Scarabæus* of Linné. The exception is the genus *Hexagonia*, which is referred by Mr. Kirby to the *Lebiadæ*. It is founded on a species, *H. terminata*, of which a description is given, and which is probably oriental. The genus appears to connect the *Lebiadæ* with the *Galeritidæ*. The *Dynastes* of MacLeay is subdivided into genera, for one of which that name has been retained, *Scarabæus Hercules* L. being taken as its type ; the other, *Megasoma*, having for its type the *Sc. Actæon* L. These are readily distinguished from each other by the external characters furnished by the horns of the head and thorax, as well as by the organs of mastication. A

third genus, *Archon*, is formed from the same family, its type, a new species under the name of *A. emarginatus*, being described in conjunction with it. *Cetonia* has also furnished materials for the formation of three genera; 1. *Genuchus*, the type of which is the *Cetonia cruenta*, Oliv.; 2. *Schizorhina*, type *C. atropunctata*, Kirby, Lin. Tr. xii.; and 3. *Gnathocera*, the *Cetonia vitticollis* of Latreille's MSS. being its type. This insect is described by Mr. Kirby, together with another species, *G. immaculata*. The remaining species described are the *Onthophagus cervicornis*, and *O. Aries*; and a new species of *Mimela*, *M. nigricans*. We regret that the necessity of restraining our notice from farther exceeding the limits to which it should be confined, compels us to omit the discriminating characters developed in this very valuable paper, from the promised continuation of which we anticipate much important additional information.

British Entomology; or Illustrations and Descriptions of the Genera of Insects, &c. By JOHN CURTIS, F.L.S. Nos. xvii and xviii.

THE first of these numbers comprises, 1. *Agrilus Chryscis*, a species new to Britain, discovered in the New Forest, and belonging to a genus of *Buprestidæ* recently established by Megerle, of which the *Buprestis viridis* may be taken as the type; 2. *Arctia conosa*, Hübn., also new to Britain, and only taken hitherto at Whittlesea Mere; 3. *Bracon Denigrator*, the male of which is now for the first time figured; and 4. *Microdon apiformis*, the *Mulio apiarius*, Fab., and *Aphritis auro-pubescentis*, Lat.

The second contains, 1. *Necrophorus Germanicus*, extremely rare as British, under which Mr. Curtis has given a synopsis of the species discovered in this country, a plan well adapted to render his work still more valuable to the collector; 2. *Thyatira Batis*, the Peach-blossom of the Collectors; 3. *Bassus Calculator*; and 4. *Cydnus dubius*, a genus established by Fabricius, but subsequently reduced by Latreille to the rank of a division of his *Pentatoma*.

ART. XXX. *Proceedings of Learned Societies on subjects connected with Zoology.*

ROYAL SOCIETY.

April 28.—The reading of Dr. Granville's *Monograph on Egyptian Mummies, with Observations on the Art of Embalming among the Ancient Egyptians*, was resumed and concluded.

The principal object of this paper was to describe a Mummy purchased at Gournou, in Upper Egypt, and presented to the author by Sir A. Edmonstone, Bart. It was in a single case, of the usual form, and covered with cere-cloth and bandages very neatly and dexterously applied, exhibiting almost every bandage and compress employed in modern surgery, and among which both cotton and linen were recognized:—these, to the amount of 28lbs avoirdupois in weight, having been removed, the body proved to be that of a female. The abdominal integuments were remarkably wrinkled, and the whole surface was of a dark brown colour and dry, but in many places soft to the touch, and with the exception of a few parts, entirely deprived of cuticle. The height of the Mummy, from the vertex of the head to the inferior surface of the calcaneum was five feet $\frac{7}{8}$ of an inch, and the principal dimensions of several parts correspond with those which are usually considered as giving rise to the utmost perfection of the female form in the European race; thus these dimensions are precisely those assigned by Camper and Winkelmann to that celebrated statue the Medicean Venus; and no *trait* of Ethiopian character was discernible in the form of the cranium: all which, Dr. Granville observed, supports Cuvier's opinion respecting the Caucasian origin of the Egyptians.

Dr. Granville then proceeded to a brief summary of the present state of our information respecting Egyptian Mummies, attributing its scantiness and imperfection to the rarity of perfect specimens, nearly all the mummies hitherto described presenting little else than imperfect skeletons, sometimes covered by the dry skin, enveloped in bandages.

In proceeding to examine and dissect the present specimen, which was effected in the presence of several medical and scientific friends of the author, the integuments and muscles of the abdomen were first removed, and the contents of that cavity carefully inspected: they consisted of a portion of the stomach, adhering to the diaphragm; the spleen, attached to the super-renal capsule of the left kidney; and the left kidney itself with the ureter descending into the bladder, which, with the uterus and its appendages were observed *in situ*, the latter exhibiting marks of disease. Fragments only of the intestinal canal were discoverable, and there were a few lumps of resin, and of a mixture of clay and bitumen, and a few pieces of myrrh. The right kidney, the liver, and the minor glands were missing; but the gall-bladder was detected among the loose fragments of membranes and other soft parts, together with remains of its own ducts. The soft parts of the pelvis were then particularly examined, and the perfect condition of the muscles, membranes, and ligaments, particularly noted. The cavity of the thorax was next examined, by detaching the diaphragm, to which part of the pericardium adhered; and the heart in a very contracted state was afterwards found suspended by its vessels and attached to the lungs, which adhered to the ribs.

Upon the examination of the cranium, it was evident that the brain had been removed through the nostrils, from the lacerated condition of the inner nasal bones; the eyes appeared not to have been disturbed, the tongue was entire, and the teeth were white and perfect.

Dr. Granville next proceeded to draw some conclusions as to the age at which this mummied female died, and respecting the disease which destroyed her. The bones of the ilium exhibit that peculiar thinness of their osseous plates, which shew the individual to have exceeded her fortieth year, and to have borne children; and as there are no characters of age or of decrepitude about the skeleton, the author considers her to have been about fifty. The ovarium and broad ligament of the right side were enveloped in a mass of diseased structure, while the fallopian tube of the same side was sound, but the uterus itself was larger

than natural, and the remains of a sac were found connected with the left ovarium, all which, in conjunction with the appearance of the abdominal integuments, leave no doubt of ovarian dropsy having been the disease under which the individual suffered. —Judging from the excavation out of which the Mummy was taken, and according to the best authorities of the present day on Egyptian Antiquities, the period at which the woman lived must have been about three thousand years ago.

The author concludes this communication with some observations respecting the method of embalming practised by the ancient Egyptians, and the nature of the substances employed in the process; from the details of which, in conjunction with the results of his own researches and experiments, as well synthetical as analytical, he draws the conclusions following :

That the abdominal viscera were more or less perfectly abstracted, either through an incision on one side of the abdomen, or, as in the present Mummy, through the anus. The thoracic cavity was not disturbed. That the contents of the cranium were removed; sometimes through the nostrils, and at others through one of the orbits. The body was then probably covered with quicklime to facilitate the removal of the cuticle, the scalp and nails being however left untouched; after which it was immersed in a melted mixture of bees'-wax, resin, and bitumen, until thoroughly penetrated; and, ultimately, subjected to a tanning liquor, probably made with the saline water of the neighbouring natron lakes; the bandages were then applied, with the occasional interposition of melted resin, or wax and resin, the lumps of resin, myrrh, &c. having been previously placed in the abdomen.

In order fully to establish these conclusions respecting the mummifying process, Dr. Granville had prepared several imitative mummies by its means; some of which bore the closest resemblance to the Egyptian, and had withstood putrefaction for upwards of three years, though exposed to the vicissitudes of a variable climate without any covering, or other precautionary measure. None of the substances used appear to be sufficient, either singly or conjointly, without the wax, to preserve the body, or convert it into a perfect mummy: and one of the *nates* of the

Egyptian Mummy having been wholly deprived of the wax by ebullition and maceration, looked no longer like its mummified fellow, but resembled a preparation of a recent specimen of that part, and soon began to putrefy. After the reading of the paper, Dr. Granville exhibited the dissected Mummy and its various parts, together with the bandages with which it had been invested, drawings of its outer case, &c., and his own imitative preparations, in the Society's Library; thus illustrating the details of his communication.

May 19.—Professor Buckland communicated a paper, *On the Fossil Elk of Ireland*; by Thomas Weaver, Esq. M.R.I.A., F.G.S., &c.

During Mr. Weaver's recent avocations in the North of Ireland, he had met with an opportunity of determining some facts, shewing that the remains of the gigantic Elk which have been found in various parts of that country, are not of antediluvian origin; but that the animal lived and died in the countries where its remains are now found. Similar facts had been ascertained in the West of Ireland, at about the same time, by the Rev. Mr. Maunsell, Archdeacon of Limerick; particulars of which had been communicated to the Royal Dublin Society, and would form, Mr. Weaver hoped, a distinct publication on the subject: but he gave some account of them in the present paper, because they directly confirmed his own deductions.

Mr. Weaver's researches were made in the county of Down, which presents hills of from 300 or 400 feet in height, consisting of alternate beds of clay-slate and fine grained greywacke, traversed by many contemporaneous veins of calcareous spar and quartz, and also intersected by some true metalliferous rake veins. Between two of these hills, at about four miles distance from the town of Dundrum, is the bog of Kilmegan, in which the facts were observed. It appears to have been a lake, which has been gradually filled up by the growth and decay of successive races of aquatic plants, and the consequent formation of peat; but on account of the remaining water, it had never been worked as a peat-hog until the present Marquis of Downshire drained it by means of a level. The peat was found to rest upon a bed of marle,

of from one to five feet in thickness, consisting of a calcareous base mingled with comminuted fragments of fresh-water shells, which it likewise contained in an entire and but slightly altered state ; all referable to three still-existing species, viz. *Helix putris*, Linn. *Turbo fontinalis*, and *Tellina carnea*. Many bones and horns of the Elk had been found from time to time in this bog, all of which, Mr. Weaver ascertained, from the concurrent testimony of the tenantry, were found either between the peat and the marle, or slightly impressed in the latter.

The researches of the Archdeacon of Limerick had been made in the peat-bog of Rathcannon in that county, where abundance of Elk's bones were found under circumstances precisely similar, and upon marle of the same kind, as in the case examined by Mr. Weaver ; and the circumstances were investigated before the bones were displaced. The Archdeacon had been enabled, with the assistance of Mr. Hart, M.R.C.S. to frame a gigantic and nearly complete skeleton, which he had presented to the Museum of the Royal Dublin Society. Some of the bones shewed marks of disease and fracture ; one leg had evidently been broken and healed again : a rib had a perforation about one-eighth of an inch wide, the edges of which were depressed on the outside, and raised on the inside ; it was such as could only have been made by a thin sharp instrument, which did not penetrate far enough to cause a mortal wound ; for, as the edges of the perforation were quite smooth, the animal must have survived the injury at least a twelvemonth. The bones seemed to retain all their principles, with the addition of a portion of carbonate of lime imbibed from the contiguous marl. A shank-bone still retained its marrow, which had the appearance of fresh suet, and blazed when applied to the flame of a candle. With them were found a pelvis, apparently belonging to a Red-Deer ; and the skull of a Dog, of about the size of a Water Spaniel.

From all these circumstances, which accord with those under which the remains of the Elk occur in the curraghs of the Isle of Man, as described by Professor Henslow, Mr. Weaver infers, that these Elks must have lived and died in the countries where they are now found ; that the period at which they lived must be

considered as modern in the physical history of the globe; and that their extinction is attributable rather to the continued persecution of their enemies, accelerated by incidental local causes, than to any general catastrophe that overwhelmed the surface of the globe; — so that their remains are not of *diluvial*, but of *post-diluvial* origin. In seeking a cause for the nearly constant distribution of these remains in Ireland, in swampy spots, Mr. W. conjectures that the animals may have fled to the lakes, which have since become bogs, as places of refuge from their enemies, and thus not unfrequently found a grave where they looked for protection.

June 2.—A paper entitled *Microscopical Observations on the Materials of the Brain, and the Ova of Animals, and the Analogy that exists between them*, was communicated by Sir E. Home, Bart. V.P.R.S.

The author first detailed the results of some experiments, made with a view to ascertain whether Frogs that had been completely frozen, could, under any circumstances, be restored to life; which he found never to be the case where the brain had been entirely congealed; the substance of which, after such a process, never regains its former appearance, but is resolved into a watery fluid, mixed with some gelatinous matter. In the act of freezing, the human brain was found to suffer a similar decomposition. The molecule of the egg is also resolved, during the process of freezing, into materials corresponding with those of the brain.

Magnified drawings, executed by Mr. Bauer, of the various substances described in this paper, accompanied the communication.

June 16.—The Society adjourned to the 17th of November next.

LINNEAN SOCIETY.

April 5.—Captain P. Parker King, F. R. & L. S. presented specimens of the Birds and Fishes he had collected in his recent Survey of the North-west Coast of New Holland.

April 19.—The reading of the Rev. Messrs. R. Sheppard's and

W. Whitear's *Catalogue of the Birds of Norfolk and Suffolk* was continued.

May 3.—Professor F. A. Bonelli, and Mons. C. S. Kunth, were elected to fill the two vacancies in the List of Foreign Members of the Society; and the reading of the *Catalogue of Norfolk and Suffolk Birds* was concluded. Annexed to this catalogue was a table of the times of migration of various Birds, as observed at several places in the above counties during a series of years.

May 24.—The Anniversary Meeting of the Society was held this day, at one o'clock, Sir J. E. Smith, *President*, in the Chair: when the following members were chosen Officers and Council for the ensuing year. *President*,—Sir J. E. Smith, Knt. M. D. F.R.S. *Vice - Presidents*,—Samuel, Lord Bishop of Carlisle, L.L.D. V.P. R.S.; A. B. Lambert, Esq. F.R.S.; W. G. Maton, M.D. F.R.S.; Edward, Lord Stanley, M.P. F.H.S. *Secretary*,—J. E. Bicheno, Esq. *Assistant Secretary*,—Richard Taylor, Esq. M.A.S. *Treasurer*,—Edward Forster, Esq. F.R.S. *Council*,—Edward Barnard, Esq. F.H.S.; Robert Brown, Esq. F.R.S.; H. T. Colebrooke, Esq. F.R.S.; Edward Horne, Esq.; Charles König, Esq. F.R.S.; Daniel Moore, Esq. F.R.S.; Rev. T. Rackett, M.A. F.R.S.; and J. F. Stephens, Esq.

The Society afterwards dined at the Freemasons' Tavern, where the presence of Sir J. E. Smith in improved health added much to the enjoyment of the day. Addresses on subjects interesting to the cultivators of Natural History were delivered by various members, and other men of science: amongst others, by the venerable Bishop of Carlisle, Lord Stanley, the Rev. Dr. Fleming, and the respective Presidents of the Horticultural and Geological Societies. Numerous expressions of respect and cordial esteem were called forth towards the late Secretary of the Society, Alexander MacLeay, Esq. F.R.S., on the occasion of his quitting this country for a time, to occupy the important station of Colonial Secretary in New South Wales.

June 7.—Lieutenant J. H. Davies and C. Willcox, Esq. communicated an account of the species of *Mytilus* from Bombay, naturalized in Portsmouth Harbour, which the latter gentleman has already noticed in this Journal.* A paper was also read,

* Vol. I. p. 590.

On the Crepitacula and Organs of Sound in Orthopterous Insects; and particularly in the Locusta camellifolia, a description of which is subjoined; by the Rev. Lansdown Guilding, B.A. F.L.S.

June 21.—The following papers were read: *Catalogue of the New Holland Birds in the Collection of the Linnean Society*; by Thomas Horsfield, M.D. F.L. & G.S., and N. A. Vigors, Esq. M.A. F.L.S.: communicated by the Zoological Club of the Linnean Society. In the introductory remarks to this paper the authors express their confident expectation that the deficiency of our knowledge of the habits of the Birds of Australia, will be in great measure supplied by the researches of Mr. A. MacLeay during his future residence in that interesting country.—*A notice on a peculiar property of a species of Echinus*; by E. T. Bennett, F. L. S.: communicated by the Zoological Club.

The Society then adjourned over the long vacation, to meet again on the First of November next.

ZOOLOGICAL CLUB OF THE LINNEAN SOCIETY.

April 12.—The Secretary exhibited a specimen of the *Gallinula Baillonii*, Temm., which had been lately taken near Melbourne, in Cambridgeshire, and had been communicated to him by the Rev. Dr. Thackeray, F.L.S. Provost of King's College, Cambridge, for the information of the Club. This is the first instance of this species, which is not uncommon in the eastern and southern parts of Europe, being recorded as a British Bird.

Mr. Swainson exhibited five new species of the genus *Thamnophilus*, Vieill., which he was about to describe in the Zoological Journal,* as also several species which had lately been described in this country: and he stated that he was now acquainted with at least twenty-five species of that genus. He particularly dwelt upon this circumstance, as it illustrated the progress of science during the last few years, the genus *Thamnophilus* having been originally founded upon a single species, the *Lanius doliiatus*, Linn., in the year 1816. This single genus now comprises nearly as many species as belonged to the whole of the genus *Lanius* in the days of Linnæus; twenty-six species only having been in-

* See the present Volume, p. 84.

cluded in the last edition of the "Systema Naturæ." He called the attention of the Club to the uniformity exhibited in the distribution of the colours throughout the genus; the plumage of all the species, with one or two exceptions, being considerably variegated, either above or below, with spots or bands; while the colours, on the contrary, of the African genus *Malaconotus*, which immediately approaches *Thamnophilus* in affinity, are distributed in large and unbroken masses, and no instance has hitherto occurred of an example of that genus having the body or tail spotted or barred. He added that it is further worthy of remark that those American *Thamnophili*, whose plumage is most unspotted, approach more closely than the rest of the genus to the African *Malaconoti*, by their robuster feet, and more rounded tail.

Mr. Vigors exhibited several species of the genus *Palæornis*, which he had lately instituted in the family of *Psittacidæ*; and he stated that the *Parrots* known to the ancients belonged exclusively to that group. He adduced some passages from the classical writers to illustrate the high estimation with which these birds were regarded by antiquity, in consequence of their beauty, their docile manners, and the imitative powers of their voice; as also to point out the characters by which they were known to the ancients, and their geographical distribution. He next proceeded to explain the situation which these birds maintain in the family, stating that it appeared to him to be nearly typical in the fifth subdivision, or subfamily, which includes the birds familiarly known to us by the title of *long-tailed Parrakeets*. He exemplified the various groups that belong to this subfamily by specimens of each which he exhibited to the Club; and he signified his intention of speedily characterizing all the groups of the *Psittacidæ*, and laying his general arrangement of them before the Club. In the course of his observations he pointed out a singular peculiarity in a New Holland genus of the family, of which the *Psit. hæmatodus*, Linn. is the type; namely, the tubular or brush-like conformation of the tongue. This conformation he exemplified in the tongue of one of the species of this genus, which was communicated to him by Mr. Yarrell for the information of the Club. He also mentioned that the Indian

group of *Lories* possess a similar peculiarity in their tongues; a fact, for the knowledge of which he was indebted to Sir Stamford Raffles, who had frequent opportunities of observing the structure of the tongue of these birds during his residence in the East. It is to be observed that these two groups of *Parrots*, thus united by this similarity of conformation, come next to each other in the general distribution of the family, by other strong and distinguishing characters.

April 28.—The Secretary exhibited a specimen of the *Accentor Alpinus*, Bechst., which was communicated to him by the Rev. Dr. Thackeray, F.L.S. for the information of the Club. This specimen, the first of the species which has been noticed in the British Islands, was killed in the garden of King's College, Cambridge, in the Autumn of 1822.

Mr. Vigors exhibited a Diagram representing the Tribes and Families into which the order of *Insectores* in Ornithology appears to be distributed; and he pointed out the typical and distinguishing characters of each of these divisional groups, and at the same time the affinities by which they are connected together. He illustrated these views by a reference to the birds themselves which represented the types of the different groups; and he explained the causes which rendered it necessary to unite the two Linnean Orders of *Pica* and *Passeres* into the present order of *Insectores* or *Perching Birds*, in order to preserve inviolate the series of affinity in which the various groups that compose these orders naturally follow each other. The discussion arising from this subject was postponed to a subsequent meeting.

May 10.—Mr. Vigors read a continuation of the "Catalogue of the New Holland Birds in the Collection of the Linnean Society," by Dr. Horsfield and himself. In this portion of the Catalogue the *Psittacidae* of New Holland were described; and the characters given of the new generic groups *Nanodes*, *Platycercus*, *Palæornis*, *Trichoglossus*, and *Calyptorhynchus*. The characters of these groups were explained by a reference to the birds themselves in the Society's Collection, which were exhibited to the meeting.

June 14.—Mr. Vigors resumed the subject, which he had com-

menced on the 28th of April, of the quinary arrangement of the *Insectorial Birds*, and the circular series of affinities by which the subdivisions return into themselves: and he entered upon the discussion of the question, arising out of the subject, which had been postponed on that evening. He explained the advantages which the present mode of investigating nature possesses over all the artificial systems which have hitherto prevailed; dwelling on the present occasion more particularly on two points; namely,—First, on the advantages which a mode of arrangement founded upon the affinities of groups exhibits, in giving the student an uninterrupted view of the connecting characters of all, the knowledge of one group leading immediately to the knowledge of that which succeeds; whereas in the systems which have hitherto been applied to Natural History, and which have been exclusively founded on division, the student, when he quits his investigation of one group, has no clue to the knowledge of that which is to follow:—and Secondly, upon the advantages resulting from the same method of arrangement, as exhibiting an uniformity in the mode of investigating corresponding or analogous groups of nature. This latter principle he illustrated by pointing out the analogous relations which exist between the five orders of the *Mammalia*, and those of Ornithology; and he drew the conclusion, that the student, having attained a knowledge of the typical characters in the five orders of either of these classes, is immediately led, by making allowances for the respective peculiarities that distinguish the two groups—i. e. *mutatis mutandis*—to a knowledge of the typical characters of the five orders belonging to the other classes. He adverted to many other corresponding analogies in the animal kingdom; and, drawing the inference from the great mass of information which already corroborated these views in so many departments of nature, that similar analogies would probably be found to exist between other groups of equal degree not yet investigated, he presumed that the mode of consulting Nature, which thus opened a passage from the knowledge of one group to the knowledge of all which correspond with it in equal rank, has a claim to be considered as of superior advantage and importance. He then took notice of some objections which had been brought

against the principles which had been explained to the Club on this and preceding evenings; and a lengthened discussion took place on the subject, which was further postponed to a future opportunity.

June 28.—Mr. Swainson exhibited drawings of a species of Bat, allied to *Phyllostoma*, which he had obtained during his residence in Brazil. The original specimens being lost, he expressed his wish that the only vestige of the species which he now possessed, should be rendered available to the purposes of science; and Mr. Brookes and Dr. Horsfield were therefore requested to direct their attention to the subject, and report thereon to the Club, Mr. Gray having promised to render assistance.

Mr. Vigors exhibited to the Meeting specimens of the different types of form that compose M. Brisson's generic group of *Icterus*. This group he stated to compose one fifth division, or sub-family, of the family of *Sturnidæ*, and to consist of the five following genera; viz. *Cassicus*, Daud., *Quiscalus*, Vieill., *Icterus*, Cuv., *Xanthornus*, Cuv., and *Leistes*, which he had lately characterized* as a genus intervening between *Xanthornus* and *Cassicus*. He explained the characteristic differences by which the typical species of these five groups are distinguished from each other, and the affinities by which they are at the same time connected together. He also exhibited specimens of two new species of the sub-family, the *Xanthornus Chrysopterus*, and *Leistes Suchii*, which he had recently described.

GEOLOGICAL SOCIETY.

June 3. — A paper was read, entitled *Remarks on Quadrupeds imbedded in recent alluvial strata*; by C. Lyell, Esq. Sec. G. S.

In a former communication to the Society, the author had stated that he had found it difficult to explain the circumstances under which the remains of Quadrupeds were very generally found imbedded in the shell marl in Scotland; often at considerable depths, and far from the borders of those lakes in which the marl is accumulated.

* See the present Number of our Journal, p. 182.

These animals must have been drowned when the lakes were of a certain depth. Their bones are found in the marle, unaccompanied by sand or gravel, or any proofs of disturbing forces. From the shape of the surrounding land in some instances, it appears that floods could not have swept them in; and from the occasional absence of rivers flowing into others, they could not have been washed in by them.

The author therefore suggests that they were lost in attempting to cross the ice in winter; the water never freezing sufficiently hard above the springs to bear their weight, and springs abounding always in those lakes in Forfarshire and Perthshire, in which marle is deposited.

The skeletons of some of the animals found in the shell marle in Forfarshire, are in a vertical position, but some are not. The same circumstance has been remarked with regard to the Elks occurring in the marle in the Isle of Man. Of these facts Mr. Lyell offers the following explanation.

Cattle which are lost in bogs and marshes sink in, and die in an erect posture, and are often found with their heads only appearing above the surface of the ground. When therefore a lake in which marle is deposited is shallow, the Quadrupeds which fall through the ice sink into the marle in the same manner, and perish in an upright posture; but when the lake is deep, and the animals are dead before they reach the bottom, they become enveloped in the marle in any position rather than the vertical.

June 17.—An extract of a letter was read from John Kingdom, Esq. communicated by Jos. Townsend, Esq. F.G.S.

Mr. Kingdom mentions in this letter the situation in which certain bones of a very large size, appearing to have belonged to a Whale and a Crocodile, were lately found completely imbedded in the Oolite Quarries, about a mile from Chipping Norton, near Chapel House.

THE NEW ZOOLOGICAL INSTITUTION.

It is with much satisfaction that we record the preliminary arrangements that have been made, for the establishment of a new

Institution, designed for the advancement and extension, in all its branches, of that important and delightful science, to assist in the promotion of which is the object of this Journal. One of the more immediate and special objects of this Institution, is the application to the uses of civilized society of some of the innumerable subjects of the animal kingdom, in every class, which have either not yet been so applied, or from which man has not yet derived all the benefits they are susceptible of affording him. We understand the plan to have been originally suggested by Sir Stamford Raffles, who appears desirous of continuing, in his native land, the honourable career of usefulness and devotion to science, which he pursued, with so much zeal and success, during his residence in the East; and we are also informed that the subject has been taken up with much interest and activity, by the illustrious President of the Royal Society, who, during the few years he has occupied his exalted station, has uniformly exerted himself in the promotion of every department of natural knowledge.

The following Prospectus, which has been extensively circulated, explains in detail the objects of the proposed establishment.

“ Prospectus of a Society for introducing and domesticating new breeds or varieties of animals, such as Quadrupeds, Birds, or Fishes, likely to be useful in common life; and for forming a general collection in Zoology.

“ Zoology, which exhibits the nature and properties of animated beings, their analogies to each other, the wonderful delicacy of their structure, and the fitness of their organs to the peculiar purposes of their existence, must be regarded not only as an amusing and interesting study, but as a most important branch of Natural Theology, teaching by the intelligent design and wonderful results of organization the wisdom and power of the Creator. In its relation to useful and immediate economical purposes, it is no less remarkable; the different races of animals employed in social life, for labour, cloathing, food, or amusement, are the direct objects of its contemplation: their improvement, the manner in which their number may be increased, the application of their produce, its connexion with various departments of

industry and manufactures, are of great importance to man in every stage of his existence, but most so in proportion as he advances in wealth, civilization, and refinement.

“ It has long been a matter of deep regret to the cultivators of Natural History, that we possess no great scientific establishments either for teaching or elucidating Zoology, and no public menageries or collections of living animals, where their nature, properties, and habits, may be studied. In almost every other part of Europe, except in the Metropolis of the British Empire, something of this kind exists ; but though richer than any other country in the extent and variety of our possessions, and having more facilities from our colonies, our fleets, and our varied and constant intercourse with every quarter of the globe, for collecting dead specimens and introducing living animals, we have as yet attempted little and done almost nothing ; and the student of Natural History, or the philosopher who wishes to examine animated nature, has no other resource but that of visiting and profiting by the magnificent institutions of a neighbouring and a rival country. It is to be hoped that this opprobrium to our age and nation may disappear, and there can scarcely be a better moment for an undertaking of this kind than the present : a state of profound peace, increasing prosperity, and overflowing wealth, when the public mind is prepared to employ its activity and direct its resources to new objects and enterprizes.

“ It is proposed to establish a Society bearing the same relation to Zoology, that the Horticultural does to Botany, and upon a similar principle and plan. The great objects should be the introduction of new varieties, breeds, and races of animals, for the purpose of domestication, or for stocking our farm-yards, woods, pleasure grounds, and wastes ; with the establishment of a general Zoological Collection, consisting of prepared specimens in the different classes and orders, so as to afford a correct view of the animal kingdom at large in as complete a series as may be practicable, and at the same time point out the analogies between the animals already domesticated, and those which are similar in character upon which the first experiments were made.

“ To promote these objects—1st. A piece of ground should be

provided, with abundance of water, and variety of soil and aspect, where covers, thickets, lakes, extensive menageries, and aviaries, may be formed; and where such Quadrupeds, Birds, and Fishes, as are imported by the Society, should be placed, for ascertaining their uses, their power of increase, or improvement.—2dly. Sufficient accommodation for the Museum should be provided in the Metropolis, with a suitable establishment, so conducted as to admit of its extension on additional means being afforded.

“It is presumed that a number of persons would feel disposed to encourage an institution of this kind; it is therefore proposed to make the annual subscription from each individual only two pounds, and the admission fee three pounds. The members, of course, will have free and constant access to the collection and grounds, and might, at a reasonable price, be furnished with living specimens, or the ova of Fishes and Birds.

“When it is considered how few amongst the immense variety of animated beings, have been hitherto applied to the uses of man, and that most of those which have been domesticated or subdued, belong to the early periods of Society, and to the efforts of savage or uncultivated nations,* it is impossible not to hope for many new, brilliant, and useful results in the same field, by the application of the wealth, ingenuity, and varied resources of a civilized people.

“It is well known, that, with respect to most of the animal tribes, domestication is a process which requires time, and that the offspring of wild animals, raised in a domestic state, are more easily tamed than their parents, and in a certain number of generations the effect is made permanent, and connected with a change, not merely in the habits, but even in the nature of the animal. Even migration may be, in certain cases, prevented, and the wildest animals supplied abundantly with food, may lose the instinct of locomotion, and their offspring acquire new habits:

* “We owe the Peacock and Common Fowl to the natives of India, most of our races of Cattle, and Swans, Geese, Ducks, to the Aborigines of Europe; the Turkey to the natives of America; the Guinea Fowl to those of Africa. The Pike and Carp, with some other Fishes, were probably introduced by the Monks.”

and a breed, fairly domesticated, is with difficulty brought back to its original state.

“ Should the Society flourish and succeed, it will not only be useful in common life, but would likewise promote the best and most extensive objects of the scientific history of animated nature, and offer a collection of living animals, such as never yet existed in ancient or modern times. The present menageries of Europe are devoted to objects of curiosity. Rome, at the period of her greatest splendour, brought savage monsters from every quarter of the world then known, to be shewn in her amphitheatres, to destroy or be destroyed, as spectacles of wonder to her citizens. It would well become Britain to offer another, and a very different series of exhibitions to the population of her Metropolis ;—animals brought from every part of the globe to be applied to some useful purpose as objects of scientific research, not of vulgar admiration ;—and upon such an institution, a Philosophy of Zoology founded, pointing out the Comparative Anatomy, the habits of life, the improvement and the methods of multiplying those races of animals which are most useful to man, and thus fixing a most beautiful and important branch of knowledge on the permanent basis of direct utility.”

March 1st, 1825.

On Wednesday, June 22d, a public meeting of the friends to the Institution took place at the Rooms of the Horticultural Society, the Earl of Darnley in the Chair; when a Committee of Noblemen and Gentlemen was chosen to further the objects of the Society, Sir Stamford Raffles being appointed the Chairman.

Persons desirous of belonging to the Society, will signify their wishes, by letter, to Mr. T. Griffiths, 21, Albemarle-street, London.

We hope to report the further progress of this Institution in our next Number.

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*** Plate VII. being erroneously referred to in the paper it illustrates, p. 234, as Tab. Supp. XI. readers are requested to correct that reference in their respective copies.

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ART. XXXI. *Descriptions of Thirteen Species of Formica, and Three Species of Culex, found in the Environs of Nice.* By WILLIAM ELFORD LEACH, M.D. F.R.S. &c. &c.

1. FORMICA RUBESCENS.

MAS. *Corpore toto nigrescente nitidissimo; abdomine ovali elongato; organis sexualibus testaceis; femoribus nigris, apice extremitateque albidis; tibiis tarsisque pallidis; squamâ crassâ emarginatâ; oculis nigris.*

Fourmis roussatre. HUBER. *Rec. sur les Mœurs de Four.* Indig. 327. t. ii. f. 3.

FÆMINA. *Corpore toto intensè rubescente nitidissimo; thorace posticè valdè rotundato et projectante; squamâ magnâ crassâ subrotundatâ; abdomine ovali, basi abruptissimè coarctato; oculis nigris; alis hyalinis, pterogosteis nigrescentibus.*

HUBER. *Rec. sur les Mœurs de Four.* Indig. 327. t. 2. f. 3.

NEUTRUM. *Corpore toto rubescente nitidissimo; abdomine segmento anali pallidiore, oculis nigris.*

Corporis longitudo. ♂ 0002½. ♀ 0005. ○ 0004.

Habitat in Montibus et Collibus propè Nicè sub Lapidibus vulgatissima.

2. FORMICA BICOLOR.

F. ♂ et ♀. *Corpore toto, pedibus antennisque testaceis hyalinis; fronte, oculis dorsoque posticè nigrescentibus; thorace posticè utrinque spinulâ acutâ armato.*

Corporis longitudo ♂ 0003. ○ 0002.

Habitat in Montibus et Collibus propè Nicè ubique vulgatissima sub Lapidibus.

3. FORMICA TESTACEIPES.

F. ○. Corpore toto fulvo-fusco, nitidissimo; thorace posticè utrinque spinulâ acutâ instructo; antennis pedibusque testaceis hyalinis; thoracè inermi.

Corporis longitudo. ○ 0003.

Habitat in Montibus et Collibus propè Nicè rarissima, sub Lapidibus.

4. FORMICA FUSCA.

F. ♂ et ♀. Corpore toto intensè ferrugineo; antennis pedibusque pallidioribus; thorace posticè utrinque spinulâ acutâ instructo.

Corporis longitudo. ♀ 0005. ○ 0002.

Habitat in Montibus et Collibus propè Nicè sub Lapidibus vulgatissima.

5. FORMICA AFFINIS.

F. ♀ et ○. Thorace, antennis, pedibus abdominisque apice et basi intensè testaceis; capite, oculis dorsique medio intensè fuscis; thorace posticè utrinque spinulâ instructo.

Magnitudo omnino *F. bicoloris*.

Habitat in Montibus et Collibus propè Nicè sub Lapidibus vulgatissima.

6. FORMICA CASTANIPES.

F. ♂ ♀ et ○. Capite, thorace abdomineque glaberrimis, nitidis, atris; antennis pedibusque intensè castaneis; thorace inermi; alis hyalinis, pterogosteis croceo-fulvis.

Corporis longitudo. ♂ 0009. ♀ 0013. ○ 0607.

Habitat in Montibus et Collibus propè Nicè sub Lapidibus vulgatissima.

7. FORMICA HUBERIANA.

F. ♂ ♀ et ○. Capite, thorace, abdomineque glabris, nitidis, atris; antennis basi femoribusque fusco-nigris; antennarum articulis omnibus minoribus, tibiis tarsisque fuscis, thorace inermi.

Corporis longitudo. ♂ 0008½. ♀ 0014. ○ 0008.

Habitat in Helvetia Boreali rarissima. *Risso*, propè Nicè sub Lapidibus vulgatissima.

8. FORMICA NICÆENSIS.

F. ♂ ♀ et ○. *Capite abdomineque fusco-nigris, glabris, nitidis; antennis, thorace pedibusque croceo-fulvis.*

Corporis longitudo. ♂ 0008. ♀ 0012½. ○ 0006 et 0004½.

Habitat infrà Lapidibus propè Nicè vulgatissima.

9. FORMICA HÆMATOCEPHALA.

F. ♂ ♀ et ○. *Capite intensè sanguineo; fronte verticeque purpureo-atris; oculis atris; thorace intensè sanguineo, atro irregulariter maculato, posticè utrinque spinulâ acutâ armato; antennis pedibusque intensè fulvo-sanguineis.*

Corporis longitudo. ♂ 0005. ♀ 0009. ○ 0004½.

Habitat sub Lapidibus in Montibus et in Collibus vulgatissima.

9. FORMICA RUPESTRIS.

F. ♂. *Capite brunneo-fulvo; oculis atris; antennis, thorace pedibusque fulvis; abdomine atro nitidissimo, segmentis omnibus posticè fulvo-marginatis; thorace inermi.*

F. ♀. *Capite intensè brunneo-fulvo; oculis atris; thorace pedibusque fulvis; abdomine atro glaberrimo, nitente.*

F. ○. *Capite, thorace, abdomineque atris, glaberimis, nitentibus; antennis basi, femoribus tibiisque nigris; tarsis antennisque, articulis minoribus ferrugineis.*

Corporis longitudo. ♂ 0010. ♀ 0012½. ○ 0008.

Habitat inter Rupium Fissuras vulgatissima.

10. FORMICA REDIANA.

F. ♂, ♀, ○. *Antennis articulis minoribus, thorace pedibusque fusco-fulvis; thorace inermi; antennis articulo basilari fulvo-fusco; capite abdomineque piceis; oculis atris.*

Corporis longitudo. ♂ 0007. ♀ 0011. ○ 7½.

Habitat propè Nicè vulgatissima.

11. *FORMICA MEGACEPHALA*.

F. ♂, ♀, ○. Capite maximo, intensè ferrugineo; oculis atris; antennis articulo basilari intensè ferrugineo, minoribus ferrugineis; thorace abdomineque glaberrimis nitentibus atris; femoribus intensè ferrugineis; tibiis tarsisque ferrugineis; thorace inermi.

Corporis longitudo. ♂ 0006. ♀ 0012. ○ 0007.

Habitat in Montibus et Collibus sub Lapidibus propè Nice vulgatissima.

12. *FORMICA GIGAS*.

F. ♂, ♀, ○. Capite thoraceque atro-velutinis; oculis aterrimis nitentibus; antennis articulo basilari perfusco, minoribus ferrugineo-fuscis; abdomine segmento primo et secundi basi coccineis, aliis atris velutinis, posticè coccineo-marginatis; femoribus basi intensè coccineis; tibiis perfuscis; tarsis fuscescentibus.

Corporis longitudo. ♂ 0009½. ♀ 0015. ○ 0009.

13. *FORMICA PICEA*.

F. ♂, ♀, ○. Capite, antennis, thorace, abdomine, pedibusque piceis, glaberrimis, nitentibus; geniculis tarsisque ferrugineis.

Corporis longitudo. ♂ 0005½. ♀ 0010. ○ 0005.

Habitat sub Lapidibus propè Nice rarior.

1. *CULEX MERIDIONALIS*.

C. capite thorace abdomineque brunneo-testaceis; abdomine segmentis omnibus posticè griseo-marginatis; pedibus cinerascenscentibus; alis hyalinis, iridescentibus, pterogosteis brunneis.

Corporis longitudo. 0006.

Habitat propè et in Nice vulgatissimus.

2. *CULEX NICÆENSIS*.

C. capite, thorace abdomineque obscurè brunneis; abdomine segmentis omnibus posticè cinereo-marginatis; pedibus cineras-

centibus, griseo-annulatis; alis hyalinis iridescentibus, pterogosteis cinerascensibus.

Culex Nicæensis, Risso MSS.

Corporis longitudo 0010.

Habitat in et propè Nicè vulgatissimus.

3. CULEX MUSICUS.

C. Capite thorace abdomineque cinereis; abdomine nigro-punctulato; segmentis omnibus posticè lacteo-marginatis; pedibus brunneo-cinereis; alis hyalinis iridescentibus, pterogosteis griseis.

Culex musicus. Risso MSS.

Corporis longitudo 0011.

Habitat in Montibus propè Nicè rarior.

This species occasionally enters the houses in Nice itself; its piping noise is by no means unpleasant, but rather agreeable than otherwise, which entitles it to the name given to it by my kind and worthy friend Professor Risso.

ART. XXXII. *A new genus of Mammalia proposed, and a Description of the Species upon which it is founded. By Mr. T. SAY, and Mr. G. ORD.**

Order. GLIRES.

Genus. NEOTOMA.

Natural Character.

Teeth 16	{	8 superior	{ 2 incisores
			{ 6 molares
	{	8 inferior	{ 2 incisores
			{ 6 molares.

Molares with profound radicles.

Superior Jaw. Incisor even and slightly rounded on its anterior face: *first Molar* with five triangles, one of which is anterior,

* From the Journal of the Acad. of Nat. Sc. of Philadelphia. Vol. IV.

two exterior, and two interior : *second Molar* with four triangles, one anterior, two on the exterior side, and a very small one on the interior side : *third Molar* with four triangles, one anterior, two exterior, and a very minute one anterior.

Inferior jaw. *Incisor* even, pointed at tip : *first Molar* with four divisions or triangles, one anterior a little irregular, then one exterior, one interior opposite, and one posterior : *second Molar* with four triangles, anterior and posterior ones nearly similar in form, and intermediate one opposite to the interior and exterior one : *third Molar* with two triangles, and an additional very small angle on the inner side of the anterior one.

Tail hairy : *fore feet* four toed with an armed rudiment of a fifth toe : *hind feet* five toed.

OBSERVATIONS. The grinding surface of the molares differs somewhat from that of the molares of the genus *Arvicola*, as will be perceived by our figures ; but the large roots of the grinders constitute a character essentially different. The folds of the enamel which mark the sides of the crown, do not descend so low as the edge of the alveolar processes ; in consequence of this conformation, the worn down tooth of an old individual must exhibit insulated circles of enamel on the grinding surface.

This genus must be placed near to *Arvicola*, of which it is probable some naturalists may be inclined to consider it a subgenus.

N. Floridana. Snout elongated ; eyes and ears very large ; tail longer than the body.

Plate X.

Ears conspicuous, thin, subovate, clothed with such fine hair as to appear naked ; *Whiskers* long, anterior ones white, the rest black : *tail* white beneath, dusky above ; its scales so small, and so well concealed with hair, as to be hardly visible : *feet* and *claws* white, the latter short : *body* and upper part of the *head* clothed in fine fur, of a lead colour, intermixed with yellowish and black hairs, the black predominating on the ridge of the back, and the top of the head,—the yellow at the sides ; the lead coloured fur not visible externally : the border of the *abdomen* and of the *throat*, buff colour : base of the *claws* covered with white hairs.

Length from the tip of the snout to the anus, seven inches and a half: tail six inches and a quarter long. Male.

The body has none of those long rigid hairs which are so notable in *Mus decumens*. The whole pelage feels velvety, particularly the belly, which is as soft as that of the common flying squirrel. The testes are hardly visible externally, differing, in this respect, from those of the house rat, which are so conspicuous an apparatus in this unwelcome guest.

This beautiful animal was discovered in a log granary, situated in a ruined and deserted plantation, in East Florida. When first aroused, it ran a short distance, then returned, and stood close by us, allowing us to touch it with a gun before it again returned. It was mild, or without that suspicious and cunning air, which is so remarkable in the common brown rat. We have reason to think that the species is not uncommon in Florida, as several individuals were seen by Mr. Say, in an old mansion; but he was unprovided with the means of capturing them.

Brought from East Florida, in the year 1818, in collection of Messrs. Maclure, Say, Ord and Peele, and deposited in the Philadelphia Museum.

The individual above described was the only one we were enabled to procure, during our journey into Florida. It was a young one, and not fully grown, as we may reasonably conjecture from the greater size of the old individual of the same species, which was procured by W. Say on the Missouri, and described in Long's expedition to the rocky mountains.

In the year 1818, Mr. Ord sent to the Philomatic Society of Paris, a short description, accompanied with a figure, of this animal, which was named *Mus Floridanus*, and the description in the Bulletin of the Society for December, in the same year. In the hurry incident to travelling, he had neglected to examine its teeth when recently killed; and afterwards assuming as a fact, what ought not to have been assumed, that it was a true *Mus*, he did not hesitate to class it under that denomination. The naturalists of Paris questioned the propriety of this nomenclature; and with Mons. de Blainville, who prepared the account for the

bulletin, appeared to coincide in the opinion that the animal was a *Myoxus*, and not a *Mus*.

That it was neither a *Myoxus* nor a *Mus*, will now be evident from the figures of its teeth. When we first commenced an examination of its teeth, we were astonished to find in the grinding surfaces of the molares, a close approximation to those of *Arvicola*; but the discovery of radicles, precluded our referring it to that genus.

Although we are aware that the multiplication of genera has become an evil, yet we have ventured to found a genus on our animal, from our inability to class it under any of the genera of the systems.

Plate X. NEOTOMA Floridana.

Fig. 1. Profile view of the Jaws, magnified.

2. Lower Jaw left side, with the alveolar process removed, in order to exhibit the roots of the teeth; natural size.

3. Molares of the upper jaw, left side, magnified.

4. Molares of the lower jaw, left side, magnified.

ART. XXXIII. *Description of a new species of Mammalia, whereon a genus is proposed to be founded. By Mr. T. SAY and Mr. G. ORD.**

Order. GLIRES.

Genus. SIGMODON.

Essential Character.

Molares in each jaw six, subequal, with radicles, and with very profound, alternate folds towards the summit.

Natural Character.

Teeth 16	{	8 superior	{	2 incisores.
				6 molares.
	{	8 inferior	{	2 incisores.
				6 molares.

* From the Journ. Acad. Nat. Sc. Phil.

Superior jaw. *Incisor* slightly rounded on its anterior face, truncated at tip: *first molar* equal in width to the second, composed of four very profound, alternate folds, two on each side, extending at least to the middle of the tooth: *second molar* quadrate, somewhat wider, and a little shorter than the preceding, with three profound folds, extending at least to the middle, two of which are on the exterior side: *posterior molar* a little narrower, but not shorter than the preceding, with three profound folds, two of which are on the exterior side, extending at least to the middle, the inner fold opposite to the anterior exterior fold, and not extending to the middle.

Inferior jaw. *Incisor* obliquely truncate at tip, the acute angle being on the inner side, it originates in the ascending branch of the maxillary bone, passing beneath the molares: *molares* subequal in breadth, inclining slightly forwards; *first molar* a little narrower than the second, with five profound, alternate folds, three of which are on the inner side: *second molar* subquadrate, with two alternate, profound folds, the inner one anterior; *third molar* about equal in length and breadth to the anterior one, but rather larger, and somewhat narrower than the second, with which it corresponds in the disposition of its folds, excepting that they are less compressed.

Tail hairy: *feet* simple: *fore feet* four toed, with the rudiment of a fifth toe having a nail: *hind feet* five toed.

OBSERVATIONS. The enamel of the molares is thick, but on the anterior face of each fold, excepting the first, it is obsolete. From the arrangement of the folds as above described, it is obvious that the configuration of the triturating surface, (occasioned by the folds of enamel dipping deeply into the body of the tooth, in the second and third molar of the lower jaw,) accurately represents the letter S, which is reversed on the right side; thus bearing considerable resemblance to the posterior tooth of the genus *Spalax*, to which also it has a slight affinity in the truncature of the inferior incisors.

The configuration of the intermediate molar of the upper jaw, may be compared to the form of the Greek letter Σ, whence our generic name.

In respect to its generic affinities, it is very obvious that its system of dentition indicates a proximity to *Arvicola*, but the different arrangement of the folds, and the circumstance of the molares being divided into radicles, certainly exclude it from that genus. With respect to radicles, it resembles the genus *Fiber*; but it is allied to this genus in no other respect.

We may further remark, that the teeth of our specimen are considerably worn, a condition that materially affects the depth of the folds.

S. hispidum. Head thick; snout elongated; eyes pretty large; ears large, round; tail nearly as long as the body.

Ears slightly clothed with hair: *fore legs* short: *hind feet* large and strong, their lateral toes very short, and their *claws* stout; *upper parts* and *head* of a pale dirty yellow ochre, mixed with black: *lower parts* cinereous; hair of the upper parts and sides, long, plentiful and coarse.

Length from the tip of the snout to the insertion of the tail, six inches; tail four inches long. Female.

In immature specimens, black is the predominating colour; in adults yellow predominates.

This animal we found to be very numerous in the deserted plantations, lying on the river St. John, in East Florida, particularly in the gardens. Its burrows are seen in every direction. Emigrants to that section of our country will, doubtless, find this species to be a great pest in rural economy.

We brought three specimens of it from East Florida in 1818, and deposited them in the Philadelphia Museum. This animal appears in classification to occupy a station between the genera *Arvicola* and *Mus*, having the habits and some of the external characters of the former, with teeth remotely allied to the latter. After a careful perusal of those authors within our reach, who have laid down the characters of Mammiferous quadrupeds, particularly Mr. F. Cuvier's recent work, entitled "*Des Dents des Mammifères considérées comme caractères Zoologiques*," we have found ourselves under the necessity of constructing a genus for it, it being impossible to refer it to any one of the genera, the

teeth of which have been figured in the above mentioned useful work.

Plate X, Fig. 5. Profile view of the jaws magnified.

6. Lower jaw, natural size, left side, with the alveolar process removed, to exhibit the roots of the teeth.

7. Molares of the upper jaw, left side, magnified.

8. Molares of the lower jaw, left side, magnified.

ART. XXXIV. *A Monograph of the Tortoises having a moveable Sternum, with Remarks on their Arrangement and Affinities.* By THOMAS BELL, Esq. F.L.S.

WHEN, amongst a group of animals agreeing in their general relations, a number of species are found to differ from the rest in some important character, and that character connected with an essential difference in anatomical structure, we are justified in considering those species as a distinct subordinate group, and, in a systematic arrangement, in applying to it a distinctive appellation. The subjects of the present memoir, were included amongst the *Emydes* of Brongniart, and in their general appearance, as well as in the structure of the different parts, they certainly have considerable affinity with them. But the circumstance of their having the *sternum* separated, as it were, into two or three divisions, moveable upon each other, led Merrem to consider them as a distinct genus, to which he applied the term *Terrapene*. Since his work was published, Mr. Say, the excellent American Zoologist, who appears not to have seen Merrem's book, has, in a paper on the freshwater and land Tortoises of the United States, also formed them into a distinct group, with the generic appellation *Cistuda*. As however the work of Merrem was published long before Mr. Say's paper made its appearance, I have retained the former name for one of the genera into which I have considered it necessary to subdivide them. M. Spix has also applied the

generic term *Kinosternon* to two species, which he discovered in Brazil.

Like the *Emydes*, they may be considered as fresh water Tortoises; and the general appearance of the shell, the distinct and subpalmed structure of the toes, with the length and sharpness of the claws, sanction such a conclusion, even were we unacquainted with their general aquatic habits. The species hitherto confounded under the term *Terrapene clausa*, and its synonymes, appear indeed at first to be exceptions to this rule, yet although known in America by the common name of Land Tortoise, and having in some measure the appearance and habits of the true *Testudines*, we find that their affinities to the rest of the group are sufficiently numerous and important to point out their natural situation amongst them. Schoepff informs us that the *T. clausa*, although sometimes found in dry situations, and from the convexity of the shell, &c. not well formed for swimming, yet loves marshy situations; and M. Say states that it is fond of moisture. There is in fact a natural transition from the Fresh-water to the Land Tortoises of this group, by means of *Terrapene Europæa* (*Testudo Europæa*, Auct.), now first transferred to that genus, which, whilst it has somewhat of the flattened form, and spreading margin of the shell, belonging to the true fluviatile species, yet approaches, in its general structure, the other species of *Terrapene*, which more nearly approximate to the Land Tortoises: it is also found to inhabit wet, marshy, or muddy places, rather than the lakes and rivers in which the more typical Fresh-water species delight.

The important character in which the species of the group now under consideration all agree, is the moveable structure of the sternum. In making a few observations upon the different modifications of this part, I shall consider the *sternum* in all of them, as consisting of three portions or lobes, of which the posterior consists of that part which is covered by the two posterior pairs of plates, the middle one by the next pair, and the anterior by the remaining anterior plates, which, however, differ in number, according as the foremost or *gular* pair, are either united into one single plate, as in *Sternotharus odoratus*, or, on the other hand,

have, interposed between them, a small supernumerary one, as in *S. Leachianus*.

From these observations it will be easy to understand the three different modifications which take place in this part. In the first, the genus *Kinosternon*, the middle lobe is quite fixed to the sides, the anterior and posterior lobes moving upon it, by means of the structure about to be described. In the second form, the genus *Sternotherus*, the middle portion is fixed as in the other, and the posterior one also connected with it by continuous bony union; the anterior lobe only being moveable. In the third, constituting the genus *Terrapene*, the middle and posterior lobes are also immovably connected together, but forming a single moveable valve, without any bony union with the upper shell,—the anterior lobe being also moveable on the same axis. The only connection between these two valves and the upper shell, is by means of a strong ligament, becoming cartilaginous at the axis.

The hinge, or connection between the valves, is formed by a sort of articular cartilage, allowing by its elasticity, of sufficient motion to enable the animal to open the shell so as to move its limbs without inconvenience, or, on the other hand, to bring it into close contact with the upper shell, and thus to enclose itself, particularly in the genus *Terrapene*, within a complete box. At the angles of these valves are small processes of bone, or at least distinct muscular impressions, to which the adductor muscles are fixed; and these, in the anterior valve of *Sternotherus Leachianus* form long spinous processes. It is obvious that in the genus *Sternotherus*, the hinder part of the shell cannot be closed, as that part of the sternum is immovable.

Upon the whole then, notwithstanding the affinities by which these animals are connected with the *Emydes* of Merrem, are such as to forbid me to consider them as a distinct family, yet the structure which I have been describing is so striking, and appears to me of so much consequence, especially as requiring a considerable addition to, or modification of, the muscular system, that I could not look upon it as forming a less important group than a subfamily, particularly as it includes several subordinate divisions, with distinct generic characters.

Fam. EMYDIDÆ.

Subfam. STERNOTHERINA.

*Digit*i distincti, acutè unguiculati.*Rostrum* corneum.*Scuta* dorsalia, tredecim.

Sternum uni-valve seu bi-valve; valvis ligamento coarticulatis, quasi super cardinem se vertentibus; et testam subindè plus minusve arcè claudentibus.

Toes distinct, with sharp claws.*Beak* horny.*Scales* of the disk thirteen.

Breast plate consisting of one or two valves, united by a ligament moving as if on a hinge, and thus capable of partially or totally closing the shell.

TESTUDO. Auct.

TERRAPENE. Merrem.

CISTUDA. Say.

Genus I. KINOSTERNON. Spix.

Sternum bivalve: lobus medius fixus; anterior et posterior mobiles, ligamentis ad lobum medium articulatæ.

Breast plate, consisting of three distinct lobes, the middle one fixed, to which the anterior and posterior, which are moveable, are articulated by a ligament.

SPECIES I.

SHAVIANUM. *K. testâ elongato-ovatâ, tricarinatâ; scutis omnibus imbricatis, marginalibus 23; sterno posticè bifido.*

Testudo Pennsylvanica var: *Shaw Gen. Zool.* III. par. I. p. 61. tab. 15.

Habitat — ?

Mus. nost.

Shell elongato-ovate, tricarinated ; the plates imbricated, those of the margin 23 in number ; sternum bifid behind.

Of this elegant species I have seen but a single specimen, now in my collection, which, as I obtained it from a dealer who had long possessed it, may, not improbably, be the identical one figured by Shaw, and stated by him to have been in the Leverian museum.

The general form of the shell is oblong, very slightly narrowed behind, obtuse before, and subemarginate, but the emargination interrupted by the projection of the central marginal plate. It is gibbous, and much rounded at the sides, as high as the lateral carinæ, between each of which and the central ridge runs a deep even furrow. The plates are polished, and elegantly sculptured ; those of the spine rather long and narrow, and of beautiful forms ; the posterior edge of each lying over the anterior one of the next. The area or nucleus of each plate, to which the different layers of horny matter are added during growth, is situated at its posterior angle. The *sternum* is considerably narrower than the upper shell, to which the middle lobe is strongly connected by bony union. The anterior and posterior moveable valves are united to the middle portion in an almost straight direction. The hinder part of the sternum is narrowed, and emarginate at the extremity. When shut, this portion does not fit the upper shell, so that it is never so close at that part as in many other species of the group.

The general colour of the upper shell is a very deep blackish brown ; the *sternum* and under part of the margin yellowish.

As the brief account given by Dr. Shaw of this interesting species is extremely vague and unsatisfactory, I have thought it necessary to enter into a more detailed description of it ; and have named it in honour of that naturalist. It is remarkable that he should for one moment have considered it as a variety of *Testudo Pennsylvanica* (Gmel.) to which it bears scarcely the least general resemblance, and from which it differs in so many essential characters. Of the animal itself unfortunately nothing is known.

SPECIES 2.

LONGICAUDATUM. *K. Testá oblongá subtricarinatá; scutis dorsalibus striatè sulcatis; marginalibus 25; caudá elongatá crassá.*

K. longicaudatum, Spix. *Test. Nov. Braz.* p. 17. tab. XII.
Habitat in Brazilia.

Shell oblong, slightly tricarinated; dorsal plates striated; marginal plates 25; tail long and thick.

This species is readily distinguished from the former by the number of marginal plates, as well as by the much slighter degree in which the shell is carinated.

SPECIES 3.

BREVICAUDATUM. *K. Testá ovata-subglobosá; scutis dorsalibus non striatis; marginalibus 25; caudá brevissimá.*

K. brevicaudatum, Spix. *Test. Nov. Braz.* p. 18. tab. XIII.
Habitat in Brazilia.

Shell ovate-subglobose; dorsal plates without striæ, marginal plates 25: tail very short.

These two species form part of the rich Zoological treasures, which are the result of the labours of Mons. Spix in Brazil.

SPECIES 4.

PENNSYLVANICUM. *K. testá ellipticá lævi; dorso planiusculo; scutis marginalibus 23.*

Testudo Pennsylvanica, Gmel. 1042. Schoepff, p. 107. t. 24. fig. A.

Terrapene Pennsylvanica. Merrem, p. 27.

Cistuda Pennsylvanica. Say, *Journ. Ac. Sc. Phil.* IV. p. 206.

Habitat in America Septentrionali.

Shell elliptical, smooth; back flattened; marginal plates 23.

The species, called by Schoepff a variety of *Testudo Pennsylvanica*, with an *immoveable* sternum, is of course an *Emys*.

SPECIES 5.

AMBOINENSE. *K. testâ ovali lævi; scutis marginalibus 24.*

Testudo Amboinensis. Daud. II. 309.

Terrapene Amboinensis. Merrem, p. 28.

Habitat in Amboinâ.

Shell oval, smooth; marginal plates 24.

SPECIES 6.

NIGRICANS. *K. testâ suborbiculatâ, carinatâ, scutis marginalibus 24.*

Testudo subnigra. Latr. I. 89. Daud. II. p. 197.

? *La noiratre. Lacep. I. p. 175. t. 13.*

Habitat —?

Shell suborbicular, carinated, marginal plates 24.

Genus II. STERNOTHERUS. Mihi.

Sternum uni-valve : lobus anterior mobilis, lobi duo posteriores connexi, immobiles.

Breast-plate having but one moveable valve; formed of the anterior lobe. The middle and posterior lobes immovably connected and fixed.

SPECIES 1.

TRIFASCIATUS. *S. collo clongato: testâ ovali, carinatâ; scutis vix imbricatis, rugoso-striatis; marginalibus 25.*

Habitat —?

Mus. nost.

Tab. Supp. XIII.

Neck very long; shell oval, carinated, slightly wrinkled; plates almost imperceptibly imbricate; marginal plates 25.

Description.

The head long, narrow, and somewhat depressed; of a yellow colour, with two deep brown bands on each side, passing from

the nostril across the orbit to the back part of the head, where they unite. The nostrils anterior, situated close together. Beak sub-elongate. The neck very long, cinereous above, yellow beneath. The fore feet have five long and sharp claws, the hinder ones four. Tail rather long and slender, and without any horny appendage at the extremity. The shell oval, broader behind, the margin slightly indented. The back carinated. The plates very thin, slightly wrinkled, and striated towards their margin. Those of the spine very slightly imbricated. The marginal plates, which are 25 in number, are of considerable proportional size, and the posterior angle of each a little projecting, so as to give an indented outline to the circumference of the shell. The pectoral plates are twelve in number, and nearly smooth. The hinder lobe of the sternum is flat, horizontal, emarginate, and placed with its edge so near to the upper shell as barely to allow of the passage of the slender tail and flattened legs. The anterior valve is very entire, and capable of completely closing that part of the shell. The general colour is a light dull yellow, intermixed with reddish and black markings. The carina is black, and there is on each side, at the distance of about three quarters of an inch, a black longitudinal band running parallel with it down the back, which gives the shell the appearance of being tricarinated. The prevailing colour of the sternum is black, with a light edge; and towards the centre it assumes also a light ground, with distinct black radiations from the area of each plate.

SPECIES 2.

LEACHIANUS. *S. testā ovatā carinatā: scutis radiatim striatis, vertebralibus imbricatis; marginalibus 24, sterni 13.*

Habitat — ?

Mus. nost.

Tab. Supp. XIV.

Amico meo carissimo Dri. Leach, sit hæc species dedicata.

Shell ovate, carinated; the plates with striæ radiating from the area; vertebral plates imbricate; marginal 24, pectoral 13.

Description.

Shell ovate, rounded before and behind, moderately convex, carinated. The plates of the back much thicker than in *S. trifasciatus*, with numerous striæ radiating from the area, and crossed at the margins by concentric rugæ. The general colour of the scuta of a very deep brown or rich blackish colour, the costal plates fulvous in the centre. The first vertebral plates quadrilateral, broad before, narrowing behind, with an elongated tubercle towards the posterior part, forming as it were the commencement of the carina. The second and third hexagonal; the fourth subpentagonal; the whole imbricated and carinated; the carina becoming more elevated to the termination of the fourth plate. The fifth subhexagonal, very narrow before, very broad behind, slightly carinated anteriorly. Lateral plates of the disk with the area smooth, the margins concentrically rugose, crossed with numerous radiating striæ. Marginal plates only 24 in number. A small portion only of the lateral ones is seen on the upper surface of the shell. Sternum rounded anteriorly, bifid behind, having 13 plates, of which seven belong to the anterior lobe. The first or single one is acutely lanceolate, the point directed backwards; the next on each side very small, and subequilaterally triangular. The anterior lobe or valve is united to the middle portion by a ligamento-cartilaginous hinge, and to the upper shell by a small membranous ligament. It is furnished internally with a long spinous process on each side, close to the angles, for the attachment of the muscles that serve to close the shell. The middle and posterior portions which are fixed to the upper shell, are connected together by bony union. The posterior portion is narrower, uni-dentated on each side, and bifid at the extremity. The plates are yellowish, passing at the edges into deep brown. They are marked with concentric and radiated striæ like those of the back.

SPECIES 3.

ODORATUS. *S. testâ ovali, convexâ, subcarinatâ; scutis marginalibus 24; sterni 11.*

Testudo odorata. Latr. Hist. Rept. I. p. 122. Daud. II. p. 189, pl. 24. f. 3.

Terrapene odorata. Merrem, p. 27.

Cistuda odorata. Say, *Journ. Ac. Sc. Phil.* IV. 206.

Habitat in Americâ Septentrionali.

Mus. Brit.

Shell oval, convex ; sternum with only eleven plates.

SPECIES 4.

BOSCH. *S. testâ ovatâ lavi* ; *scutis marginalibus* 20, *sterni* 11.

Testudo Pennsylvanica, var. 3. Daud. II. 128.

Terrapene Boschii. Merrem, p. 27.

Habitat in Americâ Septentrionali.

Shell ovate, smooth ; marginal plates 20, pectoral 11.

I give this species from Merrem's description, not having seen a specimen of it. It is not mentioned by Mr. Say in his account of the Land and Freshwater Tortoises of the United States, in the *Journal of the Academy of Natural Sciences, of Philadelphia*.

Genus III. TERRAPENE. Merrem.

CISTUDA. Say.

Sternum bivalve ; valva utraque eodem axe mobilis ; valva posterior portionum duarum posteriorum sterni sistens.

Sternum bivalve ; the two valves moving on the same axis ; the posterior valve consisting of the two posterior portions or lobes of the sternum.

SPECIES 1.

EUROPEA. *T. testâ ovatâ planiusculâ, subcarinatâ ; subradiatim punctatâ.*

Testudo Europæa. Schneid. *Schildkr.* 323. Schoepff, p. 1. t. 1. Shaw, *Gen. Zool.* 30. t. 5.

T. lutaria. Linn. *S. N.* p. 352.

? *T. orbicularis.* Linn. *S. N.* p. 351.

T. Meleagris. Shaw, *Nat. Misc.* 4. p. 144.

Emys lutaria. Merrem, p. 24.

Habitat in Europâ temperatâ.

Mus. Nost.

Shell ovate, flattish, subcarinated; spotted in a radiated manner.

On examining some time since a shell of this species, the first I had seen, which had lost the sternum, I was struck with the appearance of the articular surface from which that part had been removed, and immediately concluded that it must belong to the present group, having a moveable breast plate, notwithstanding Merrem, to whom belongs the credit of having separated the "Box Tortoises" under his subgeneric division *Terrapene*, retains this species amongst his *Emydes*, the character of which, in contradistinction to *Terrapene*, is, that the sternum is entire and fixed. On consulting Schoepff, I found that, with his usual accuracy, that authour had mentioned the moveable structure of the sternum, and subsequent observations have established my first conjecture that it belongs to this genus.*

SPECIES 2.

CAROLINA. *T. ovato-gibbâ, livido-fuscâ, luteo subconfertè maculatâ; scutis rugosis. Sterno postice rotundato.*

Testudo Carolina. Linn. S. N. I. p. 352. Gmel. 1041. Schneid. 334.

T. clausa. Gmel. 1042. Schoepff, p. 32. t. 7.

Terrapene clausa. Merrem, p. 27.

Cistuda clausa. Say, Journ. Acad. Sc. Phil. IV. p. 205.

Habitat in Americâ.

Mus. Nost.

Shell ovate-gibbous, of a livid brown colour, with yellow subcontiguous spots; plates wrinkled: sternum rounded behind.

SPECIES 3.

MACULATA. *T. testâ subglobosâ, subcarinatâ, nigrâ albo-maculatâ; scutis distanter sulcatis. Sterno postice integro, rotundato.*

Habitat — ?

Mus. Nost.

* "Sutura sterni transversalis media laxior est reliquis, et mobilitatem aliquam concedit, ita ut uterque lobus, magis tamen anterior, ad superiorem testam nonnihil propius admoveri possit."—Schoepff Hist. Test. p. 3, de Test. Europæâ.

Shell subglobose; subcarinated, black with whitish spots; plates sulcated, the sulci distant: sternum entire, and rounded behind.

SPECIES 4.

NEBULOSA. *T. testâ ovatâ, interruptè carinatâ, fusco flavoque nebulosâ; scutis striatis. Sterno postice subcoarctato.*

Habitat — ?

Mus. Nost.

Shell ovate, interruptedly carinated, clouded with brown and yellow; plates closely striated: sternum contracted towards the back part.

It is difficult to establish the synonymes of the last three species. They have hitherto been so completely confounded, if indeed they have all been described, that it is scarcely possible to ascertain which species is intended by any particular author who has mentioned either of them. They are however sufficiently distinct, and I have endeavoured in the specific character given to each, to obviate as far as possible the confusion which has hitherto attached to them. As the term *clausa* is equally applicable to them all, and indeed to all the Tortoises capable of completely shutting the shell, I have omitted it wholly; and have retained the trivial name *Carolina*, (which was first applied by Linneus to the species since designated by the former term) for that species which in form and markings is in some measure intermediate between the other two. *T. nebulosa* is much longer than the others in proportion to its breadth; the plates are more prominent, and finely striated. The markings, instead of being distinct, are clouded, and in some measure softening into each other. The sternum also differs remarkably in not being capable of entirely closing the shell, in consequence of being narrowed at the posterious part. *T. maculata* differs from *Carolina* principally in the want of striæ on the scales, and in the line between the lateral and vertebral rows of dorsal scuta, which in the former is nearly straight, and in the latter is very deeply indented, in consequence of the more angular form of the scuta.

ART. XXXV. *On two Genera and several Species of Crinoidea.* By THOMAS SAY, Esq.*

I AM indebted to the politeness and liberality of Dr. J. Bigsby, for the opportunity of describing the very interesting Animal Remains which form the subject of the following new Genus.

Family CRINOIDEA.

Genus CARYOCRINITES.

Generic Character. Column cylindrical, perforated by a tubular alimentary canal: *pelvis* formed of four plates; *costal* six, supporting the *scapulae*, from which the arms proceed.

In Miller's arrangement this genus will occupy a station in the division *Inarticulata*, between the genera *Cyathocrinites* and *Actinocrinites*. It may be indicated by the following formulæ.

- A. Pelvis of four plates.
- A. Costal plates six.
- a. Column not dilated.
- o. Alimentary canal round.
- §. Articulating surface of the columnar joints radiated.
- †. Auxiliary side arms cylindrical and placed irregularly, Genus CARYOCRINITES.
- 1. Two of the costals hexagonal; 1st species *C. ornatus*, tab. nost. f. 1.
- 2. One of the costals hexagonal; 2nd species *C. lorincatus*.

Species.

- 1. *C. ornatus*. Costals, four pentagonal and two hexagonal.

Column inserted into a cavity at the base of the pelvis: *pelvis* rather large; two of the plates quadrangular, attenuated to the base, where they are truncated and a little recurved at the junction with the column; disks, particularly towards the base, granulated, with a distinct elevated interrupted line; two remaining plates pentangular, attenuated to the base, where they are truncated and a little recurved at the junction with the column; disk

* From the Journal of the Academy of Natural Sciences of Philadelphia, Vol. IV. No. 9.

with elevated granules, and with two elevated interrupted lines, extending to the terminal angles: *costals*, four pentagonal and two hexagonal, all with elevated interrupted lines, radiating from the centre to the angles, with a series of truncated granules on each side, and a few granules in the intervening spaces; *inter-scapulars*, two hexagonal, situated immediately above the hexagonal *costals*: *scapulars* six pentagonal, the upper sides of which are more or less irregular by projecting a little between the scapulæ, all with prominent lines granulated, similar to those of the preceding: *arms* six: *capital plates* with a heptagonal one in the middle, surrounded by five heptagonal plates and two irregular ones at the mouth: mouth not prominent, situated on one side of the middle, a little within the line of the arms, closed by small valvular pieces, its inferior side resting on the superior angle of one of the scapulars.

Longitudinal diameter from three quarters to one inch and a half; transverse diameter from seven-tenths to one inch and two-fifths.

2. *C. loricatus*. *Costals*, five pentagonal, and one hexagonal.

Resembles the preceding, but there is only one hexagonal *costal* plate, and one *interscapular* plate.

Longitudinal diameter one inch and eleven-twentieths; transverse diameter one inch and three-tenths.

Dr. Bigsby obtained seven specimens of the *ornatus*, and one of the *loricatus*. He informs me that "they are found loose in brown clay at the foot of the ravine at Lockport, in which the New York canal mounts the parallel ridge of Lake Ontario. They are extremely numerous, but almost always worn and crushed. They are filled with the clay in which they are imbedded. They are from one one-tenth to one-eighth of an inch thick in their parietes. The clay rests upon horizontal, black, conchiferous limestone, in which I found part of an *encrinital* stomach, bearing a close, if not perfect resemblance to the *Caryocrinites* described by Mr. Say."

In the second volume of Silliman's Journal, p. 36, I instituted a new genus for the truly singular animal *Reliquium*, which Parkinson called *Kentucky Asterial Fossil*. I shall now proceed to

correct the characters of that genus agreeably to the discoveries of the ingenious Miller, in this family, and to identify by name the species which I then indicated.

PENTREMITE.

Column cylindrical, perforated; segments articulating by radiated surfaces, with cylindrical side arms at irregular intervals: *pelvis* of three unequal pieces, two pentagonal and one tetragonal: *scapulæ* large, very profoundly emarginate for the reception of the tips of the radiating ambulacræ, obliquely truncated at the extremities on each side, for the reception of one side of a subrhomboidal plate or interscapular: *ambulacræ* five, radiating from the summit and terminating at the tips of the emarginations of the scapulæ; each with a longitudinal, indented line, and numerous transverse striæ which terminate in a marginal series of pores, for the transmission of respiratory tubes: *summit* with five rounded openings (ovaries) and an angulated central one (mouth and anus.)

This singular genus is so remotely allied to any other hitherto discovered, that I do not think it can with propriety, be referred to any family yet instituted. By its columnar support it is related to the family Crinoidea; but the total absence of arms and hands excludes it from that very natural group. The superior termination, in which the ambulacræ, the rounded openings, and the central angulated one, are situated, has some affinity to the family Echinidea, but the columnar support shows that it cannot be arranged there.

Having thus on its inferior portion a resemblance to the Crinoidea, and on its superior surface a decided analogy to the Echinidea, I think it may with propriety form an intermediate family, under the following name and characters.

Family, BLASTOIDEA.

Column composed of numerous articulating segments, supporting at its summit a number of plates, so united as to form a calyciform body containing the viscera; arms none; branchiæ arranged in ambulacræ.

In a natural series these bodies constitute the link between the *Crinoidea* and the *Echinidea*, on the one hand, whilst on the other, the former is unquestionably, but not more obviously connected with the *Stelleridica*, by the unequivocal intervention of *Comatula* and *Marsupites*. Of all the genera of *Crinoidea*, it is to *Platycrinites* that *Pentremite* seems most closely related.

Species.

1. *P. globosa*. Body subglobular; sutures with parallel impressed lines. Length one inch and one-fifth; greatest breadth one inch and three tenths.

Description.—*Pelvis* deep saucer-shaped, convex; longitudinal sutures without parallel lines of increment, but these are very obvious at the terminal margin: *scapulars* with the impressed lines of increment very obvious at base; and near the tip each side: *ambulacræ* with impressed lines equidistant between the central line and the lateral series of pores.

This large and fine species belongs to the Philadelphia Museum. It was brought from England by Mr. Reubens Peal, who understood that it was found in the vicinity of Bath. None of this species, I believe; has yet been found in America. The parallel lines of increment margining the sutures, distinguish this from the following species.

2. *P. pyriformis*. Body oblong, pelvis gradually attenuated. Length from three-quarters to one inch and a quarter.

This species is found in plenty in Kentucky, in the same localities, and intimately intermixed with the succeeding species; it may be readily distinguished by the gradual attenuation of the pelvis and contiguous parts, from the tips of the emarginations of the *scapulæ*, to the origin of the column. The first specimen I saw, was dug up in a garden at Reading, and was sent to my brother, B. Say, under the name of "petrified althea bud."

3. *P. florealis*, Schloth. Pelvis terminating abruptly, nearly horizontal.

Length from seven-tenths to nearly half an inch.

SYNONYMES.

Kentucky Asterol Fossil, Park. *Org. Rem.* V. 2. pl. 13.
Encrinites florealis, Schloth. petrif. (as quoted by Miller.)

This is extremely abundant in many parts of Kentucky, and on the margins of the Mississippi in a few places. Near Huntsville they are very numerous; and on the surface of a fragment of rock, three inches long, by two and a quarter wide, sent to the Academy by Mr. Hazard of that place, I have enumerated eighteen specimens of this species more or less entire, and two specimens of the preceeding species. On another still smaller piece of rock are twenty-one specimens, all in *alto relievo*, two of which are of the preceding species. On a third fragment of rock, thirty may be counted, and on a fourth upwards of fifty.

That these animals were predunculated and fixed, there cannot be any doubt. We see at the base of the pelvis a small rounded surface, perforated in the centre for the passage of the alimentary canal, and on the outer margin are very short, but distinct radii of elevated lines, evidently intended for articulation with the first joint of the column. The column itself is always found in fragments accompanying the body of the animal, but never attached to it.

I think it highly probable that the branchial apparatus communicated with the surrounding fluid through the pores of the ambulacræ, by means of filamentous processes; these may also have performed the office of tentacula in conveying the food to the mouth, which was, perhaps, provided with an exsertile proboscis; or may we not rather suppose that the animal fed on the minute beings that abounded in the sea water, and that it obtained them in the manner of Ascidia, by taking them in with the water. The residuum of digestion appears to have been rejected through the mouth.

ART. XXXVI. *Note on the foregoing Paper, together with a Description of a new Species of Pentremites.* By G. B. SOWERBY, Esq. F.L.S., &c.

THE almost anomalous form and singular structure of the bodies distinguished by Mr. Say by the name of *Pentremite* (*Pentremites*) has been the cause that some attention has also been given to them in this country. The circumstance, however, of all the specimens received in this country from Kentucky, being changed into a sort of calcedony or chert, has perhaps not only prevented British Naturalists from forming a correct judgment of their natural affinities, as a family, but appears also to have had the effect of preventing us from recognizing the generic resemblance to the species that occur here, which, bearing so much greater a similarity to some of the *Echinidæ* has caused some of our Naturalists to class them together: for it is observable that of perhaps twenty specimens of the "*Kentucky Asterial Fossil*" that I have examined, only one individual shows the sutures that separate what Say calls the "*pelvic, scapular and interscapular*" plates or pieces. The examination of the above mentioned individual, has however suggested to me the probability that part of the three unequal pieces Say calls the Pelvis, may in fact prove to be *costals*, because a little protuberance, "at the base of the pelvis" having, "a small rounded surface" being "perforated in the center for the passage of the alimentary canal," and having "on the outer margin, very short, but distinct radii of elevated lines evidently intended for articulation with the first joint of the column," is actually divided by a suture from the superior portion of what Say calls the pelvis, and in the same manner is separated into three, distinct, nearly equal portions, and may consequently alone form the pelvis; thus evidencing one more circumstance in which the genus is related to the *Crinoidea*.

The circumstance of Say's first species, *P. globosa*, having been brought from England, led me at first to suppose that he might refer to one of those species that has come into my hands; his description, however, is so incomplete and the terms he has

used are so vague, that I have not been able to ascertain the fact, I think nevertheless, that "*Pelvis* deep saucer-shaped, convex," may serve to distinguish it from both. I shall now proceed to describe, as well as I can, the two species of this interesting Genus that I have met with.

SPECIES 4. *Pentremites Derbiensis*. Subglobosa, supernè, latior; granulosa. *Pelvis* minimus, pentagonalis, concavus; *scapulares* mediocres, subdepressæ, supernè latiores, emarginationis interscapularis angulo obtusissimo; *interscapulares* maximi, ad centrum supernè ferè attingentes; *ambulacræ* lineares, angusti, prominentes, series duas confertas monilium efformantes. Long. $\frac{1}{8}$. Lat. $\frac{1}{2}$ unc.

In general form the *Pentremites Derbiensis* may be described as subglobose, its upper extremity being rather broader; its pelvis is very small, pentagonal, and concave, according, however, most strictly with the generic character; *scapulars* middling in size, pressed down and the interscapular notch at the upper edge having a very obtuse angle; these are much shorter than in the succeeding species and much wider at the upper part than at the base: *interscapulars* very large, reaching nearly to the center at the upper extremity, and about three-fifths of the distance from the upper towards the lower, broad at their base: *ambulacræ* linear, narrow, rather prominent, formed as it were by the lateral union of two strings of little beads. The whole surface of the pelvis, scapulars and interscapulars is covered with minute grains, and both on the scapulars and interscapulars there are horizontal striæ, which may probably be the lines of growth.

Two specimens of this curious fossil were sent some years ago, by Mr. White Watson, to my late father, in whose collection they now remain: by Mr. Watson they were called *Echini*, he supposes them to be peculiar to Derbyshire, and states that they belong to the twenty-sixth bed of limestone.

SPECIES 5. *Pentremites elliptica*: elliptica, infra subtruncata; pelvis minimus, pentagonalis, subconcavus; *scapulares* maximi, supernè latiores, emarginationis interscapularis angulo

acutiusculo; *interscapulares* mediocres, ad centrum supernè fere attingentes; *ambulacræ* angusti, sublineares, supernè paululum expansi, sulcis longitudinalibus tribus, interstitiis crenulatis. Long. $\frac{4}{16}$. lat. $\frac{7}{16}$ unc.

This species of *Pentremites* is elliptical, subtruncate at its inferior extremity, where the *ambulacræ* terminate and form five somewhat angular prominences; the *pelvis* is very small, pentagonal and rather concave; *scapulars* very large reaching three-fifths of the distance from the base towards the upper extremity, broader at the upper part, the interscapular notch at the upper edge having a rather acute angle: *interscapulars* of moderate size, nearly reaching to the center above, quadrangular, the upper angle being the more acute: *ambulacræ* narrow, nearly linear, spreading a little at the upper end, forming three longitudinal grooves, of which the interstices are crenulated. The external surface of pelvis, scapulars and interscapulars is covered in this as well as the last species with minute grains, which are partly arranged in rows corresponding with the lines of growth.

A few specimens of this singular production have been obligingly communicated to me by Mr. Joseph Kenyon of Preston, Lancashire, near which place they are found.

ART. XXXVII. *Notice of a Fossil belonging to the Class Radiaria, found by Dr. Bigsby in Canada. By G. B. SOWERBY, Esq. F.L.S., &c.*

AMONG the numerous and highly interesting organic remains discovered by the indefatigable Dr. Bigsby in Canada, the truly singular and new one which he has obligingly permitted us to describe in the present number, may perhaps, on account of its belonging to a family so very rarely found in a fossil state, be considered as one of the most interesting and valuable.

Upon examination of this fossil we do not immediately recognize its affinities, for it bears a near resemblance to the arms of

an *Asterias* lying on an *Echinus*; we think, however, judging from the want of ambulacra, that it would be properly placed among the genera of the *Asteriade*: at the same time its vicinity in general form to Say's Family of *Blastoidea* renders it doubtful whether it ought not to be considered as a connecting link to be placed between the two families of *Crinoidea* and *Blastoidea*, and this suggestion obtains support from the apparently lateral situation of the mouth; in which respect it resembles some of the *Crinoidea*. This suggestion, however, involves the following consideration, namely, whether those rays in the *Blastoidea*, which by Say are called *ambulacræ* (a term commonly applied to an apparently corresponding part in the *Echinida*,) really serve the same purpose? or whether they be not arms as in the other *Crinoidea*? and I venture to assert that there is nothing either in their position or form that militates against such an idea.

I hope the following description, together with the figure by which it will be accompanied, (Tab XI. f. 5.) will serve to give as correct an idea of the fossil in question as can be conveyed without the actual examination of the specimen.

The general form, as far as we can judge from the specimen in which none of the lower part is preserved, is a depressed spheroid; and it does not appear to have naturally any angular prominences, though owing to the circumstance of its being divided into five sections, it might possibly be very obtusely pentagonal. It appears to have consisted of a number of irregular, partly imbricated, crustaceous plates, and its upper half is divided into five sections or compartments, by five equal arms which diverge from the center and are curved all in the same direction. The compartments are not equal in size, in the largest of them and near its center is placed the *mouth*? which appears to have been surrounded by two or three rows of very minute, imbricated, crustaceous scales; the arms, five in number, all diminishing to a point at their outer extremity, and having their upper portion elevated above the body, seem, however, to be attached to it by their under side, and, indeed, partly bedded in it; each one is divided into two equal parts by a longitudinal groove, and each of these parts is again divided into a number of segments by trans-

verse and deep grooves, which are close set, being about half their length distant from each other. I cannot ascertain whether there is any natural opening in the center or not. The whole is changed into crystalline Carbonate of Lime coloured by iron rust; and it lies upon a mass of Limestone containing remains of *Encrini* and *Madrepores*; a single spiral univalve is also to be observed. From the falls of the *Chaudière*, on the Ottawa River in Lower Canada.

Reference to the Plate.

PL. XI.

- Fig. 1. *Caryocrinites ornatus*. *b.* the pelvic plates; *c.* the costal plates.
2. *Pentremites florealis*. *a.* natural size; *b.* pelvic or costal plates; *c.* the scapular plates; *d.* the interscapular plates; *e.* the ambulacræ; *f.* the five terminal apertures surrounding the mouth; *g.* pelvis.
3. *Pentremites Derbiensis*. *a.* natural size; *b.* pelvic or costal plates; *c.* the scapular plates; *d.* the interscapular plates; *e.* the ambulacræ; *f.* the five terminal apertures surrounding the mouth.
4. *Pentremites elliptica*. *a.* natural size; *b.* pelvic or costal plates; *c.* the scapular plates; *d.* the interscapular plates; *e.* the ambulacræ; *f.* the five terminal apertures surrounding the mouth.
5. Fossil animal belonging to the family of *Asteriadae* from Canada.
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ART. XXXVIII. *Descriptions of two new species of the Genus ORBICULA.* By G. B. SOWERBY, F.L.S. &c.

DR. BIGSBY'S researches in Canada have, among other novelties, produced one of the two new species of this singular genus here described, and the other has been found without any locality among the stores so long preserved by Mr. G. Humphrey. I have

however ascertained, that it is found at Whitby, from a specimen sent from that place to my brother by John Hogg, Esq. Jun. of Leeds.

ORBICULA.

Sp. *O. cancellata*, testâ orbiculari, vertice postico, marginali; valvarum superficie lineis elevatis, confertis, radiantibus, lineis incrementi elevatis decussatis; valvæ inferioris vertice excentrali, lævi, depresso, sinu byssi parvo, brevi.

Icon. Tab. nost. XI. f. 6.

The general form of this shell is orbicular, and very flat, being more gibbous near the posterior extremity: the vertex of the upper valve is quite marginal, and posterior; its surface is covered with close-set elevated lines, radiating from the vertex, and which are crossed by the elevated lines of growth, so that the entire surface has a finely reticulated appearance: the vertex of the lower valve is also nearly marginal, having at the posterior edge a rather deep cavity, in which the sinus (through which the disk of attachment passes) is placed: the surface of this valve is reticulated in the same manner as in the other, except near the umbo, where it is smooth, and the lines of growth are not elevated, but form complete rings, partly descending into the cavity above-mentioned. The shell itself is extremely thin: it occurs in a light brownish grey limestone, containing also remains of *Terebratulæ* and *Coralloids*. I am indebted to Dr. Bigsby for the opportunity of describing this species, which he brought from horizontal limestone resting on Augitic trap, one mile north of Montreal in Lower Canada.

Sp. *O. reflexa*: testâ subellipticâ, posticè acutiusculâ, politâ; valvâ superiore convexiusculâ, vertice postico, submarginali; valvâ inferiore planâ, vertice subcentrali, margine reflexo; sinu byssi magno, elongato.

Icon. Tab. nost. f. 7.

The general form of this species is rather elliptical, a little acuminate posteriorly—and it is quite smooth and polished all over, being only marked with the lines of growth: the upper valve is convex, its vertex is submarginal, being placed considera-

bly nearer to the posterior than to the anterior margin : the lower valve is flat, its vertex placed near the center, and its margin very thin and reflected. The sinus through which the byssus passes, is large and elongated, and placed in a cavity posterior to the vertex of the lower valve. All the specimens I have seen are preserved in argillaceous iron stone nodules.

ART. XXXIX. *On LEPTOPHINA, a group of Serpents comprising the Genus Dryinus of Merrem, and a newly formed Genus proposed to be named Leptophis. By THOMAS BELL, Esq. F.L.S.*

THE genus *Coluber* of Linnæus consists of several very distinct subordinate groups, some of which are so obvious as to require merely a cursory observation to detect them, whilst others demand a more rigorous investigation to discover their affinities, and to assign their natural limits. The separation of the genus *Elaps* by Schneider, of *Naia* and of *Dipsas* by Laurenti, of *Vipera* by Daudin, of *Dryinus* by Merrem, &c. still leaves much to be done before the groups are well understood, and their natural arrangement ascertained. Of those which have hitherto been established, not one rests on a firmer basis, or is more naturally and distinctly defined than the genus *Dryinus* of Merrem : but upon an examination of several other species of Linnean *Colubri*, of similar habits and conformation, I find so many points of affinity as to claim for them a situation in the same superior group, though undoubtedly they must be considered as generically distinct ; and to these I propose to give the name *Leptophis* (from *λεπτός* *gracilis* and *ἔφις* *serpens*).

The whole of the serpents composing these genera live in woods, entwining themselves amongst the branches of trees, and gliding with great rapidity and elegance from one to another. These habits, combined with the graceful slenderness of their form, the beautiful metallic reflection from the surface in some species, and the bright and changeable hues in others, place them amongst the most interesting of the serpent tribe. Their food consists of large insects, young birds, &c. which the extra-

ordinary size of the head, the width of gape, and the great dilatability of the neck and body enable them to swallow, notwithstanding the small size of these parts in a state of rest: in a specimen in my possession of *D. auratus* for instance, the length of which is four feet nine inches, the diameter of the neck is barely two lines. When the skin is distended either by food, or during inspiration, the scales are separated from each other, and the skin, which is of a different colour, becomes visible in the interstices, producing a curious reticulated appearance.

Notwithstanding the poisonous mark was affixed by Linnæus to the only species of *Dryinus* known to him, (*Coluber mycterizans* L.), it is well ascertained that they are all of them perfectly harmless, and it is asserted of that species that the children are in the habit of taming and playing with them, twining them round their neck and arms, and that the snakes appear pleased at being thus caressed.

In their general characters, the two genera composing this group are very closely allied. The body is extremely long in proportion to its breadth,—the tail more than half, and in some species, nearly equalling the length of the body,—the head broad and long, covered, as in the other *Colubridæ*, with nine scuta, which however do not extend so far back as in the rest of the family. The hinder part of the head is covered with numerous very small scales. The scales of the back are of an elongated oval form, those on the spine, in some species, broader and somewhat rhomboidal, which is also the case with the lateral row immediately above the abdominal scuta. The scuta of the belly are almost as * long as they are broad. Those of the tail numerous, closely attached, and from the attenuated form of that part, difficult to be distinguished.

The principal difference between the two genera consists in the form of the rostrum. In *Dryinus* the upper jaw projects far beyond the lower; and is considerably attenuated towards the apex, which in some species is distinctly mucronate, turned up and

* I consider the length of the scuta, their diameter from the anterior to the posterior margin: the breadth, across the abdomen.

moveable. In *Leptophis* the rostrum is obtuse, and the upper jaw projects but very slightly beyond the lower.

Of the first genus there are three species now known in the old continent and as many in the new ; for the whole of those inhabiting India we are indebted to Dr. Russell, in whose work they are figured. Of the three American species, one was described by Catesby, a second has lately been discovered in Brazil, by that indefatigable investigator M. Spix, and the third I have very recently received with some other serpents from Mexico.

Familia. COLUBRIDÆ.

? Subfam. LEPTOPHINA.

Caput elongatum, anticè attenuatum, posticè latum, scutis novem anticè tectum. *Oculi* magni. *Oris rictus* peramplus, undatus. *Dentes* in maxillis et palato ; tela nulla. *Corpus* gracillimum, subdepressum. *Cauda* longissima, tenuis, apicè acuta. *Squamæ dorsales* ovales, elongatæ, laxæ ; *caudales* minimæ, confertæ. *Scuta abdominalia* longissima. *Scutella subcaudalia* parva, subindistincta.

Head elongate, broad behind, narrowed before ; the anterior part covered with nine scuta. Eyes large. Gape wide, somewhat waved. Maxillary and palatine teeth ; no poisonous fangs. Body very slender, slightly depressed, tail very long, slender, the point acute. Dorsal scales oval, elongate, loose ; caudal scales very small, closely arranged. Abdominal scuta very * long ; subcaudal scuta small, indistinct.

Genus. DRYINUS. Merrem.

Char. Gen. *Maxilla superior* inferiore multò longior. *Rostrum* attenuatum, apice acuto vel subacuto, in nunnulis speciebus mucronato, mobili.

Upper jaw much longer than the lower. Rostrum very narrow, more or less acute at the apex, which in some species is distinctly mucronate and moveable.

* Vide note p. 323.

ÆNEUS. Dr. suprà fuscus, subtùs pallidior, aureo nitens, rostro acuminato, mobili.

Scuta abdominalia.

Scutella subcaudalia.

Spix & Wagler Serp. Nov. Braz. t. 3. p. 12.

Habitat in Brazilæ sylvis, prope fluvium Simoëns.

Brown above, paler beneath, shining with a golden lustre; rostrum acuminate, moveable.

AURATUS. Dr. griseo-flavescens, aureo pallidè nitens, albido nigro-que punctulatus; rostro subobtusum.

Scuta abdominalia, 196.

Scutella subcaudalia, 160.

Habitat in Mexico.

Mus. nost.

Tab. nost. XII.

Yellowish grey, shining with pale gold colour, dotted with whitish and black; rostrum subobtusum.

Description.

The head is very flat, and considerably elongated, the upper jaw extending about a line beyond the lower; the rostrum straight and rather obtuse. The opening of the mouth is long and slightly waved. The scuta covering the head, which, as in all the species of the family, are nine in number, extend farther back than in most others of the genus. The scales of the body are oval, narrow, rather pointed, imbricate, very flexible, and a little turned up at the apex. The abdominal scuta are little less than two lines long, whilst their breadth is barely three lines. The tail is excessively slender and slightly quadrangular, the apex acute.

The general colour is light grey, with a slight cast of pink, varying with light gold colour, and of a metallic lustre. The whole body is spotted with minute blackish and whitish dots. It is paler and more uniform beneath. The upper part of the head is of an uniform grey. A fine black line runs from the nostrils back-

wards, across the lower part of the eye, to about half an inch beyond the head, between which and the mouth the space is quite white.

DIMENSIONS.

	ft.	in.	lin.
Total length	4	9	0
Length of the head	0	1	2
Length of the tail	2	0	0
Breadth of the head	0	0	5
Breadth of the neck	0	0	2
Breadth of the abdomen	0	0	4

This elegant species has considerable relation to *Dr. æneus* of Spix and Wagler; it is, however, not only of a very different colour, and of more slender proportions, but it is also strikingly distinct in the structure of the elongated rostrum, which in *Dr. æneus* is acute, mucronated and moveable, whilst in our species it is obtuse, and even rather abruptly truncated.

MYCTERIZANS. *Dr. viridis, lineis plurimis lateralibus flavis; dente longissimo in mediâ maxillâ superiori; rostro recurvo.*

Scutta abdominalia, 191—192.

Scutella subcaudalia, 167—173. Merrem.

Seba Thes. II. t. xxiii. fig. 2.

Bluish green snake. *Catesby Carol.* II. t. 47.

Coluber mycterizans. *Lin. S. N.* 389. *Shaw Gen. Zool.* III. pt. 2. p. 546.

La nazique. *Lacep. Serp.* II. p. 277. t. 4. fig. 2.

Natrix mycterizans. *Laur. Rept.* p. 79.

? *N. flagelliformis.* *Laur. l. c.*

Dryinus mycterizans. *Merrem Syst. Amph.* p. 136.

Habitat in Carolinæ Sylvis, in arboribus.

Green, with several yellow lateral lines; one tooth much longer than the others, in the middle of the upper jaw.

OXYRHYNUS. *Dr. supra flavo-viridis, subtus pallidè virescens, lineâ utrinque abdominali albidâ; rostro acuminato.*

Scuta abdominalia, 179.

Scutella subcaudalia, 130—166.

Passeriki Pam. *Russell Ind. Serp.* I. t. xii. p. 16.

? *Coluber mycterizans*. *Daud. Rept.* VII. p. 9.

Coluber mycterizans, var. *Shaw III. pt. II. p. 547.*

Dryinus nasutus. *Merrem Amph.* p. 136.

Habitat in Indiâ orientali.

Yellow green above, pale greenish beneath, a whitish line along the abdomen on each side ; rostrum acuminated.

NASUTUS. *Dr. suprâ lætè, subtus pallidè viridis, lineâ utrinque abdominali flavâ ; rostro subacuto, non mucronato.*

Scuta abdominalia, 209.

Scutella subcaudalia, 160.

Seba II. t. liii. fig. 4.

Coluber nasutus. *Shaw Gen. Zool.* III. pt. I. p. 548.

Russell Ind. Serp. II. t. xxiv. p. 28.

Habitat in Insulâ Javâ.

Bright green above, paler beneath, with a yellow abdominal line on each side ; rostrum subacute, not mucronated.

RUSSELLIANUS. *Dr. suprâ glaucus, subtus pallidè rufescens, nigro minutè punctato ; rostro mucronato.*

Scuta abdominalia, 174.

Scutella subcaudalia, 148.

Botla Passeriki. *Russell Ind. Serp.* I. t. xiii. p. 18.

Coluber mycterizans var. *Shaw Gen. Zool.* III. pt. II. p. 547.

Dryinus nasutus var. *Merrem Syst. Amp.* p. 136.

Habitat in Indiâ orientali rarior.

Glaucous green above, pale reddish beneath, minutely dotted with black ; rostrum mucronate.

That these four species are distinct, the characters given of them by those who have seen them living, and observed their habits, as well as examined their structure, sufficiently prove. Merrem was the first to separate *Dr. mycterizans* from the *Passeriki* *pam* of Dr. Russell, who had considered these two species as identical. Merrem has however most erroneously considered

the three Oriental species figured in the splendid work of Russell as one; at least the *Bolla Passeriki* and the *Passeriki pam* of the latter author are given as synonymes to *Dr. nasutus*; but as this last trivial name was previously assigned to another species by Dr. Shaw, I have given the name of *oxyrhyncus* to one, and *Russellianus* to the other species hitherto not named, and retained *nasutus* for that to which this name was originally given. I think it necessary to mention here that the distinctive characters given by Merrem to his two species are perfectly nugatory.

Genus. LEPTOPHIS.

PURPURASCENS. *L. violaceo-virescens, aureo nitens; lineâ dorsali, atque utrinque laterali, pallidis; capite obtuso.*

Scuta abdominalia, 198—201.

Scutella subcaudalia, 145—156.

Seba Thes. II. t. lxxxii. fig. 3.

? *Scheuchz. Phys. Sacr. t. 630. fig. A.*

Coluber purpurascens, Shaw. Gen. Zool. III. pt. 2. p. 549.

Merrem Amph. p. 120.

Habitat in Indiâ orientali.

Mus. Nost.

Violet changing to green, gilded; a lateral and dorsal line of a paler hue; head obtuse.

AHÆTULLA. *L. viridi-cæruleus, nitidissimus, abdomine pallido, fasciâ oculari nigrâ, rostro subacuto.*

Scuta abdominalia, 163.

Scutella subcaudalia, 150.

Seba Thes. II. t. lxxxii. fig. 1.

Coluber Ahætulla, Lin. S. N. p. 387. Mus. Ad. Fr. p. 32. t. 22. Shaw, Gen. Zool. II. part 2, p. 550. Merrem Amph. p. 121.

Habitat in Indiâ orientali.

Bright blue green, iridescent, abdomen pale; a black line across the eyes; rostrum subacute.

ÆSTIVUS. *L. viridi-purpurascens, abdomine virescente; rostro obtuso.*

Scuta abdominalia, 155.

Scutella subcaudalia, 144.

Green Snake. *Caterby Carol. II. p. 57.*

Coluber æstivus. Lin. S. N. 387. Shaw, Gen. Zool. III. pt. 2. p. 551. Merrem, p. 121.

Le verdatre *Encyc. Method.*

Habitat in Carolinâ.

Blue green above, greenish beneath, rostrum obtuse.

MANCAS. *L. supra glaucus, abdomine pallide luteo, lineis binis latis virescentibus.*

Scuta abdominalia, 186.

Scutella subcaudalia, 153.

Mancas. *Russell Ind. Serp. II. t. 25. p. 29.*

Rooka. *Ib.*

Habitat in Indiâ orientali.

Glaucous green above, pale yellowish beneath, with two broad greenish lines.

ART. XL. *The generic and specific Characters &c. of Ophidian, Chelonian, and Batrachian Reptilia, discovered by M. SPIX in Brazil.**

AMPHIBIA.

ORDO II. *Pedes nulli.*

SERPENTES.

TRIBUS A.

Serpentes innocui : Tela nulla ; Dentes maxillares et palatini.

* Extracted from the following works:

1. *Serpentum Braziliensium species novæ, ou Histoire Naturelle des espè-*

FAMILIA II. OPHIDII.

a. COLUBRINI. *Caput* supra scutis octo vel novem, occipitalibus magnis, superciliaribus plerumque convexis; *oris rictus*, excepto genere *ELAPIS*, amplus, ab angulo declivis; *cauda* subtus scutis aut omnibus aut plurimis divisus, apice conica, recta; *lingua* valde extensilis, bifurca.

Genus v. ELAPS.

Scuta caudæ subtus omnia divisa; *caput* indistinctum aut subdistinctum; *Oris rictus* parvovs, subrectus; *truncus* plerumque lævissimus; *cauda* in plurimis teres; *oculi* rotundi, parvi.

Species 1. SCHRANKII.

E. albidus; annulis seu potius fasciis latis nigris, supra in media sordide-fuscescentibus; annulis caudæ anticis geminis, posticis simplicibus.

Species 2. MARTII.

E. supra pallide violaceo-rubicundus; fasciis annularibus nigris, margaritis albis quasi marginatis, infra disjunctis.

Species 3. TRIANGULARIS.

E. pallide cyaneo-niger; trunco caudaque subtriquetris; annulis dilutioribus, in dorso pallide cyaneis, ad latera roseis, in abdomine albis.

Species 4. VENUSTISSIMUS.

E. cinnabarinus; annulis nigris in medio et ad marginam albido-viridibus: squamis apice nigris; capite nigro, fascia supra alba, nigro bipunctata.

Species 5. MELANOCEPHALUS.

E. capite supra et nucha nigris; occipite albo-bipunctato; cor-

ces nouvelles de Serpens, recueillies et observées pendant le voyage dans l'intérieur du Brésil dans les Années 1817, 1818, 1819, 1820, exécuté par ordre de sa Majesté le roi de Bavière, publiée par Jean de Spix, écrite d'après les notes du voyageur par Jean Wagler.

2. Species Novæ Testudinum et Ranarum, quas in itinere per Braziliam, Annis 1817—1820, jussu et auspiciis Maximiliani Josephi I. Bavarie Regis Suscepto, collegit et descripsit Dr. J. B. de Spix.

pore supra brunneo ; linea longitudinali in dorso a nucha usque ad caudæ apicem obscuriore, recta, tenui ; corpore et cauda subtus albicanti-flavis, immaculatis.

Species 6. LANGSDORFFI.

E. supra nigerrimus maculis minutis separatis flavidis, transversim positis ; subtus flavidis fasciis latiusculis rubris.

Genus VII. DRYINUS.

Scuta caudæ subtus omnia divisa ; *caput* longum rostrom acutissimo, mobili ; *oculi* lateraliter in medio capitis ; *truncus* gracillimus ; *cauda* longissima ; *scuta rostralia* plerumque duo.

Species 1. ÆNEUS.

D. capite supra fusco ; stria nigricante a naribus per oculos usque ultra occiput producta ; labiis albis ; corpore et cauda pallide fuscis, aureo nitentibus.

Genus VIII. NATRIX.

Scuta caudæ subtus omnia divisa ; *caput* aut vix distinctum aut distinctum ; *scutum rostrale* convexum ; *oris rictus* ab angulo declivis, amplus ; *squamæ trunci* aut laeves aut carinatae.

Species 1. CHIAMETLA.

N. reticulata ; squamis olivaceo-virescentibus, nigro marginatis ; capite, trunco et cauda subtus alboflavidis, immaculatis.

Seba Thes. II. tab. 36. f. 4. tab. 61. f. 1.

Coluber Chiametla Shaw. Gen. Zool. III. p. 440. Merr. Tent. Syst. Amph. p. 135. n. 190.

Species 2, G. FORSTERI.

N. tota fuscescenti-olivacea, immaculata ; squamis trunci anterioris lateraliter albo marginatis ; corpore inferiore fuscescenti-flavido, immaculato.

Species 3. MELANOSTIGMA.

N. supra fuscescenti-olivacea ; subtus alba ; scutis abdominalibus coerulescenti-marginatis, in utroque latere puncto nigro notatis ; cauda infra tota alba.

Species 4. LACERTINA.

N. supra olivacea squamis dorsi nonnullis intermixtis nigris, albido marginatis, reliquis omnibus in medio impressis ; infra flavescenti-albicans lineolis numerosis, maculatis, longitudinalibus, nigricativirescentibus.

Species 5. CINNAMOMEA.

N. tota cinnamomea, immaculata ; squamis lævibus,

Species 6. OCCIPITALIS.

N. pallide fuscescenti-albicans ; squamis apice fuscis ; vertice, occipite et nucha fusco-nigris.

Species 7. BICARINATA.

N. fuscescenti-virescens ; dorso tænia albicante utrinque carinata ; abdomine flavicanti-albo, scutis nigricanti marginatis.

Species 8. SCURRULA.

N. supra testaceo-rufa et nigro-subviolaceo varia ; dorso lateraliter compresso ; corpore et cauda subtus testaceo-rufis, nigro maculatis ; capite supra nigricanti-brunco ; fronte rufescente.

Species 9. SULPHUREA.

N. toto virescenti-sulphurea, immaculata ; squamis dorsi carinatis, medii laterum lincola vix elevata, nigricante notatis, caudæ lævibus.

Species 10. BAHIENSIS.

N. glauco-cinèrascens ; maculis in dorso nigris subrotundis, in linea longitudinali positis, utrinque ad trunci latera minoribus, omnibus albido marginatis ; abdomine et cauda subtus albis ; stria nigra transversa supra oculos et altera tenuiori supra nares.

Species 11. CHERSEOIDES.

N. supra olivacea ; dorso ejusque lateribus maculis nigricanti-

bus, in dorso interdum cohærentibus et subdentatis; capite supra lituris figurisque arcuatis notato; abdomine et cauda subtus maculis irregularibus numerosis nigricantibus.

Species 12. *ALMADA*.

N. dorso fuscus cente, lineolis transversis albicantibus, interdum medio interruptis; trunci lateribus nigro maculatis; abdomine albo, fasciis nigris haud raro alternantibus; cauda subtus alba, immaculata.

Species 13. *OCELLATA*.

N. corpore et cauda subtus nigricanti-pallide olivaceis; lineis duabus in dorso, rectis, albidis, ab occipite usque ultra caudæ originem prolongatis; punctis ad trunci latera obscurioribus, in medio albis, utrinque in linea recta positis.

Species 14. *SEMILINEATA*.

N. supra cinerascenti-cyanea; subtus flavicanti-alba; linea nigra, recta, tenui, lateraliter a trunco medio usque ad eius apicem prolongata.

Species 15. *SEXCARINATA*.

N. supra nigro-fusca, immaculata, subtus pallidior; capite subtus et gula flavidis squamis laevibus; squamarum carinatarum seriebus sex a dorso medio fere usque ad caudæ originem.

Species 16. *ASPERA*.

N. supra cinerascenti-fuscescens; maculis in dorso obscurioribus, nigricanti marginatis, magnis, transversis, ut plurimum disjunctis; lateribus trunci albido maculatis; capite subtus et gula flavido-albicantibus; corpore subtus fuscescenti-cinereo, maculis nigris transversis, alternantibus.

Species 17. *PUNCTATISSIMA*.

N. supra fuscescens; squamis nonnullis vix nigricanti marginatis; ad latera trunci linea subobsoleta nigricante; subtus flavido-albicans, lineis duabus geminis punctisque minimis, numerosissimis.

Genus XI. XIPHOSOMA.

Corpus quam maxime compressum, fusiforme; *dentes* antice in utraque maxilla trini et quini maximi; *caput* magnum, triangulum, supra rostrum squamis magnis obtectum; *scuta abdominalia* tenuissima; *scuta caudæ* subtus integra; *calcaria* ad anum nulla.

Species 1. ORNATUM.

X. fuscescenti-nigricans; maculis nigerrimis, magnis, utrinque ad dorsi latera, in dorso subjunctis flavidoque marginatis; abdomine flavido, nigro maculato.

Species 2. DORSUALE.

X. cinerascenti-violaceum; maculis in dorso flavidis, acute angulatis, interruptis; abdomine flavido.

Species 3. ARARAMBOYA.

X. supra laete viride; striis in dorso transversis, flavidis, interdum angulatis; gula abdomineque flavidis.

TRIBUS B.

Serpentes nocui : Tela.

c. VIPERINI. *Tela*, et præter ea *dentes imperforati* in maxillâ superiore; *vertex* scutatus, excepto genere *CHERSYDRI*, vertice squamoso; *oris rictus* amplus, ad angulum subdeclivis; *cauda* subtus scutis vel integris aut divisis, vel integris et divisis; *corpus* infra aut scutellatum, aut squamosum.

Genus XIII. OPHIS.

Denses imperforati parvi ante tela, pone illa nulli; *scuta abdominalia* lata; *scuta caudæ* subtus omnia divisa.

Species 1. MERREMII.

O. sordide fuscescens aut pallide olivaceus, immaculatus, aut maculis transveris obscurioribus interdum subrhomboidalibus variegatus; abdomine et cauda subtus sordide albicantibus aut flavicantibus.

d. HYDRINI. *Tela* 1—6 in utroque latere maxillæ superioris; *dentes imperforati* in palato et maxillâ inferiore, in maxillâ superiore nulli; *caput* supra scutatum, aut squamatum et anticè scutellatum; *scuta caudæ* subtus integra aut divisa, aut integra et divisa.

Genus XVIII. MICRURUS.

Cauda brevissima, apice acutiuscula; *scuta caudæ* subtus integra et divisa; *caput* indistinctum, obtusum, scutis supra novem.

Species 1. SPRIXII.

M. albido fuscescens; squamis-apice fuscis, laevibus; trunco caudæque nigro annulatis.

Genus XXVI. BOTHROPS.

Caput supra aut squamosum aut antice subscutellatum, scutis superciliaribus mediocribus; *fovea* utrinque inter nares et oculos intermedia; *cauda* teres, apice simplex.

Species 1. MEGÆRA.

B. supra fuscescenti-virescens, fasciis obscurioribus, utrinque fusco-nigro marginatis; corpore inferiore flavido, immaculato.

Species 2. FURIA.

B. totus obscure fuscus; abdomine flavido, interdum nigricanti-submaculato.

Species 3. LEUCOSTIGMA.

B. capite et dorso supra fuscis; dorso fasciis latiusculis, obscurioribus; corpore inferiore cinerascens, lateraliter albicanti-punctato; cauda apicem versus ochraceo-albicante.

Species 4. TESSALLATUS.

B. supra fuscus, fasciis obscurioribus; stria rufo-fusca pone oculos; abdomine albido, nigricanti-fusco tessellato.

Species 5. TENIATUS.

B. supra albido-pallide virescens, in dorso fasciis binis obscurio-

ribus, subapproximatis; corpore inferiore cinerascente, albido-consperso et ocellato.

Species 6. NEUWIEDI.

B. supra dilute fuscus, maculis in dorso magnis obscurioribus plerumque in utroque apice sinuatis, fuscescenti-flavido marginatis; maculis ad trunci latera minoribus longiusculis; scutis abdominalibus flavidis, transverse nigricanti nubilatis.

Species 7. LEUCURUS.

B. fuscescenti-cinerascens; dorso maculis transversis, seu fasciis interruptis, nigricantibus; trunci lateribus punctis maiusculis nigris; abdomine albido; cauda apice alba.

Species 8. SURUCUCU.

B. corpore toto ochraceo-stramineo; maculis in dorso rufis, fuscis, subrhomboidalibus; abdomine et cauda subtus immaculatis.

Curucucu *Marcgrav. Brazil. pag. 241. Seba Thes. II. tab. 76. fig. 1.*

Crotalus mutus Linn. *Syst. Nat.* 1. p. 373. *Boa muta* Laccp. *Quadr. ovis.* II. p. 389. *Schneid. Hist. Amph.* II. 253. *Scytale catenata.* Latr. *Rept.* III. p. 162. *Scytale Ammodytes* Latr. *l. c.* p. 165. *Daud. Rept.* V. p. 347. *Lachesis Muta* Daud. *l. c.* V. p. 351. ? *Lachesis Atra.* Daud. *l. c.* p. 354. *Crotaline Boa* Shaw. *Gen. Zool.* III. p. 352. *Coluber Alecto.* Shaw *l. c.* p. 400. *Die lange Viper.* Merr. *Wetterauische Annal.* I. S. 10. T. 2. *Trigonocephale à losanges.* Cuv. *Reg. an.* II. p. 81. *Cophias Crotalinus* Merr. *Syst. Amph.* p. 154. n. 1.

Genus XXVII. CROTALUS.

Fovea utrinque inter nares et oculos intermedia; *cauda* apice crepitaculo, e vesiculis corneis consistente, aucta.

Species I. CASCAVELLA.

C. fuscescens; dorso maculis rhomboidalibus, fuscis, flavido

marginatis, ad latera in strias duas, angulatas ac divergentes excurrentibus.

FAMILIA III. HELMINTHOPHES.

Truncus cylindricus, subnudus, et squamulis, plerumque mollibus, vix conspicuis ac cuti quasi immersis, sulcisque longitudinalibus seu annularibus instructus, in solo genere *STENOSTOMATIS* squamatus; *oculi* minutissimi et cute communi, crassiore obtecti (excepta specie *Stenostomatis albifrontis*, cujus oculi majusculi et non obtecti); *anus* vel transversus vel rotundus, prope finem corporis aut in ejus apice; *cauda* aut brevissima, apice obtusa, (excepta specie *Amphisbænæ oxyuræ*), aut omnino nulla.

Genus I. STENOSTOMA.

Caput minutum, antice scutatum; *corpus*, totum squamis undique æqualibus tectum; *cauda* teres, brevissima, obtusa, apice aculeo parvo munita; *oris rictus* angustus; *os* inferum; *dentes* (an in omnibus?) nulli; *lingua* longiuscula, bifurca.

Species I. ALBIFRONS.

St. rufo-fuscum nitidum, squamis albidæ submarginatis; fronte caudæque apice albis.

Genus II. LEPOSTERNON.

Caput et *sternum* scutata; *truncus* et *cauda* annulati; *oris rictus* parvus, rectus; *dentes* maxillares, palatini nulli; *lingua* planiuscula, antice incisa; *pore* ante *anum* nulli.

Species I. MICROCEPHALUS.

L. sordide albidum; trunco supra annulato, fusco, punctis elevatis minutis, fuscescentibus, in annulos positos, subtus flavido-albido, sutura intermedia longitudinali, lineis X-formibus exarata.

Genus III. AMPHISBÆNA.

Truncus et *cauda* annulati, reticulis impressis quadrangularibus oblecta; *caput* scutatum; *dentes* maxillares, palatini nulli; *lingua* brevis, planiuscula; antice incisa; pori subelevati ante anum transversum.

Species 1. OXYURA.

A. tota fusca; cauda apice acutiuscula.

Species 2. VERMICULARIS.

A. vermicularis, supra rufescenti-fuscescens, subtus subochraceo-albida.

Genus IV. CÆCILIA.

Corpus nudum, ad latera caudamque rugosum, aut annulatum; *lingua* planiuscula; *dentes* maxillares et palatini: *cauda* obtusissima vix ulla aut omnino nulla; *orificium ani* rotundum.

Species I. ANNULATA.

C. olivaceo-virescens; trunco æquali annulis valde impressis, dilutioribus 201 et 210.

ORDO III. TESTUDINES.

Animal testâ immobili, cum costis connatâ obtectum, tetrapodum, caudatum, repens vel natans, animalculis, herbis vel fructibus victitans, mas pene simplici instructus feminam insidento fecundans, foemina ova numerosa subrotunda membranacea in fossa arenosa ad maris, fluvii vel lacus ripam excavata deponens, non incubans; tympano aurium extus conspicuo; maxillis corneis edentatis pyxidum instar se claudentibus; digitis unguiculatis; ventriculo cordis simplici bi-auriculato; pulmonibus persistentibus, metamorphosi, uti in ranis, non subjectis.

Genus I. EMYS.

Fluviatilis vel lacustris; testâ convexo-depressâ, oblongâ;

palmis pentadactylis, *plantis* tetradactylis, utrisque depressis; *digitis* elongatis semipalmatis vel palmatis, acute unguiculatis; *sterno* immobili.

Species 1. *E. AMAZONICA.*

Maxima, magnitudine *Chelonis Mydæ*, brunneo nigricans vel grisea, subtus flavescens; capite squamoso, depresso, antice compresso, brevi, vix adunco, supra inter oculos approximatos sulcato, postice largissimo; scutello verticali triangulo posticè elongato; gulâ unicirrhosâ; testâ ovatâ, immarginatâ; posticè dilatâtâ, planiusculâ; scutello dorsi marginali antico intermedio nullo; bracteâ pectoris versus caudam bifurcatâ pentagonâ, pone acuminatâ; pedibus squamatis, largè palmatis, squamis latis aliisque linearibus transversis.

Habitat in fluvio Solimoëns et confluentibus Javary, Rio Branco.

Species 2. *E. VIRIDIS.*

Mediocris, supra olivaceo, virescens, sulbus viridi-flavicans, testâ ellipticâ, subæquali; scutello dorsi intermedio antico impari sublineari, rectangulo; pectoris impari cordiformi, largissimo; pectore oblongo, antice largiusculo, truncatè marginato, posticè augustiore, bifurcato.

Habitat in aquis lacustribus fluminis Carinhanhæ, confluentis Sti. Francisci.

Species 3. *E. DEPRESSA.*

Exigua, rufescente-nigricans, capite non squamis sed membranâ tecto; collo cirrhoso, exserto; testâ ellipticâ, posticè gibbosâ, acutè, ad femora angulate marginatâ, supra dorsum subsulcatâ; scutis dorsi reticulatis, medio nodosis, antico spinali maximo; bracteâ marginali pectoris impari pentagonâ, longâ; pectore posticè subbifurcato; caudâ brevissimâ, vix exsertâ.

Habitat in aquis paludosis provinciarum Rio de Janeiro et fluminis Sti. Francisci.

Species 4. *E. MACROCEPHALA.*

Grandis, supra nigerrima, subtus nigro-rufescens; capite crassissimo, convexo, supra nasum non sulcato; collo exserto, minus crasso; testâ cylindrico-ovatâ, majore quam in *Emyde Tracaxa*,

antice angustiore, minus emarginatâ magisque elevato-convexa; scutis dorsi lævibus, non striatis, nigerrimis, minus sinuose emarginatis, posticis marginalibus geminis; bractea pectoris antice impari pentagona, apice largiore, rectangula; pectore posticè testam non attingente; unguibus depressis, validis, nigris.

Habitat solitariè et rarissima, ab incolis Cabecudo dicta prope pagum Airon ad ripam fluminis Yau, confluentis Rio Negro.

Species 5. *E. TRACAXA.*

Grandis, supra olivaceo fusca, subtus flavicans; capite subcrasso, postice convexo; testâ ovato-subcylindricâ, elevatâ, anticlatiore ac minus sinuoso-marginatâ quam in *Emyde Macrocephalâ* scutis dorsi undulate ac radiatim striatis magisque sinuose marginatis, postico marginali simplici; bracteis pectoris substriatis; anticâ impari acute rhomboideâ, apice angustissimâ, tertiâ subtriquetrâ, largiore quam in *Emyde Macrocephalâ*; pectore postice testâ brevior.

Habitat solitarie et monogama ad ripam et insulas fluminis Solimoëns et confluentium.

Species 6. *E. RUFIPES.*

Mediocris, supra nigro-brunnescens, subtus flavo-ferruginea, capite crasso, depresso, supra scutellis, lateraliter squamulis munito; gula bicirrhosa; testa elliptica, medio dorso longitudinaliter acuta; scuto dorsi marginali impari lineari, pectoris subrotundo, medio excavato; pedibus squamis scutelliformibus hispidis, largissime palmatis; unguibus compressis, acutis.

Habitat ad ripam fluminis Solimoëns.

Species 7. *E. ERYTHROCEPHALA.*

Mediocris, supra fusca, subtus flavo-albicans; capite flavo-aurantio; oculis minus approximatis; rostro infra nares subfisso; sulco supra inter oculos longiore quam in *Emyde Amazonicâ*; scutello verticis subcordiformi, antice rotundato, postice acuto, brevi; bracteâ pectoris marginali impari postice rotundatâ; pectore postice rotundato-excavato; gulâ non cirrhosâ; scuto antico dorsi marginali intermedio nullo.

Habitat in aquis ripariis fluminis Solimoëns, Jurura Campeva cognominata.

Species 8. *E. CANALICULATA.*

Exigua, fusco-nigricans; capite plano, supra ferrugineo, subtus nigro; collo supra rufo, verrucoso echinato, subtus squamuloso; testâ nigricante, ellipticâ, convexo-depressâ, ad marginem externum sursum revolutâ, in medio dorso longitudinaliter largè canaliculatâ; scutello dorsi antico impari brevi, rectangulo, pectoris pentagono, magno; pedibus brevibus, squamis acutis, hispidis; plantis, præcipue palmis subglobosis; caudâ minimâ, vix exsertâ.

Habitat sub cognomine Japutipirema in campis paludosis juxta ripam fluminis Solimoëns.

Species 9. *E. DORSUALIS.*

Minima, ovata, supra olivaceo-virescens, depressa, in medio squamoso, nigro, lateraliter flavo-lineato, scutis granulosis; bracteis pectoris duodecim; pedibus squamosis, sulphureis, nigro lineolatis; caudâ brevissimâ, apice subcornuâ.

Habitat juxta flumen Solimoëns.

10. *E. STENOPS.*

Minima, nigerrima, planiuscula; capite supra squamulis plurimis obsito; rostro subobtusum, inter oculos angustum; testâ depressâ, in medio dorso convexâ; scutis spinalibus sex, transverse elongatis, granulosis; caudâ vix exsertâ.

Habitat in locis aquosis ad ripam fluminis Solimoëns.

11. *E. MARMOREA.*

Subexigua, olivaceo-brunneoque virescens, subtus flavicans, ad gulam non cirrhosa; capite lævi, non squamoso, lineolis flavis insigni; maxillis pectoreque flavidis; testâ ovato-depressa, virescenti-flavo nigroque variegatâ; scuto marginali antico impari tetragono, subbrevis; scutis flavo-marginatis, marginalibus sursum flavo-dentatis; bracteis pectoris 12, caudâ colloque exsertis.

Genus II. CHELYS.

Capite membranaceo colloque longo depressis, planis, latis fimbrose-appendiculatis; *naso* tenui, tubuliformi, proboscideo, elongato; *rostro* tenui, minuto; *maxillâ inferiore* postice crassiore, elevatâ; *ore* rotundato; *testâ* depressâ, acute carinatâ, lateraliter acute marginatâ; *palmis* pentadactylis, *plantis* tetradactylis, utrisque palmatis, depressis.

Species 12. C. MATAMATA.

Mediocris, aspectu horribilis, fusco-rufa; capite supra et infra tympanum membranâ fimbriatâ large alato; *maxillâ inferiore* infra superiorem prominente, non serratâ; *gulâ* colloque appendicibus membranosis fimbriatis verrucisque obsitis; *testâ* ovatâ, supra dorsum acute tricarinatâ; *scutis* concentrice granulatis; *pedibus* squamosis, squamis solitariis crassis, seriatim positis.

Habitat ad urbem Paræ in aquis stagnantibus fluminis Amazonarum.

Genus III. KINOSTERNON.

Structura Emydis, *pectore* modo cataphracto; *maxillis* et *capite* supra inter oculos nudo squamosis; *rostro* pernasuto; *oculis* minus approximatis; *gulâ* subtus multicirrhosâ; *caudâ* apice unguiculatâ; *bracteis pectoris* undecim, illis pectus inter et testam interjacentibus non connatis; *pulpebris* transversis.

Species 13. K. LONGICAUDATUM.

Supra rufo-nigricans, subtus nigro-rufum; *testâ* oblongâ, in medio dorsi subtricarinatâ; *scutis* striate sulcatis; *caudâ* elongatâ, crassâ.

Habitat in campis aquosis, ab incolis Mucua dicta.

Species 14. K. BREVICAUDATUM.

Nigro-fuscum, præcedente minus, ovato-subglobosum; *caudâ* brevissimâ, breviter unguiculatâ; *scutis* dorsi non striatis, marginali impari vix conspicuo, pectoris rotundato, largo; *pectore* subconvexo, apice vix furcato.

Habitat ad ripam fluminis Solimoëns.

Genus IV. TESTUDO.

Terrestris; *capite* subglobose-elevato; *maxillis* lacertinis, serratis; *gulâ* non cirrhosâ; *testâ* elevatâ, globosâ; *pedibus* squamosis, cylindricis, robustis; *palms plantisque* globoclavatis; *digitis* brevissimis, vix distinctis, non palmatis; *unguibus* crassis, rectis.

Species 15. T. HERCULES.

Maxima, supra et subtus aurantio-flava; scutis lævibus, planiusculis, viridi-nigro-marginatis, spinali postico maxime gibbo antice acuminato, marginali antico impari nullo; *testâ* elongatâ, ellipticâ, fere cylindricâ, supra planiusculâ, truncatâ, vix declivi, ad femora angulatâ et magis crassâ, posticè gibba; lateraliter compressâ, acute ovatâ; sterno antice angustiore, longiore, subbifurcato; testam fere exsuperante; disco scutorum medio large ochraceo; pedibus flavicantibus; non rubro-maculatis; caudâ testam non exsuperante.

Habitat in sylvis ad flumen Solimoëns, ubi incolis Japuty Grande audit.

Species 16. T. SCULPTA.

Mediocris, citrino-ochracea; *testâ* subcylindricâ, globoso-elevatâ, citrino-flavescente, postice subrotundatâ; scutis planiusculis, medio granulatis tuberculatisque, ad margines fusciscentibus, strigilatis, strigis subrectangulis; scutis spinalibus transversè oblongis, hexagonis, antico impari deficiente: pectore antice dentato, postice breviorè quam scutum.

Habitat in sylvis juxta flumen Amazonum, Xurubariga ab incolis dicta.

Species 17. T. CARBONARIA.

Subgrandis, virescenti-nigra vel nigerrima; disco scutorum subrectangulo-pentagono, minore, aurantio; capite supra antice scutellato; *testâ* cylindrico-elevatâ, subquadratâ, anticè et posticè obtusiore; in medio dorso vix convexâ; pedibus coccineo-maculatis.

Habitat sub cognomine "Capitary" (?) ad flumen Amazonum.

Species 18. T. CAGADO.

Mediocris, olivaceo-brunnescens, lævis; testâ irregulariter flavo-variegatâ, subæquali, cylindricâ, in medio dorso planissimâ; scutis spinalibus, præcipue penultimo, planis, subquadratis, postico majore quam in testudine Carolinensi.

Habitat sub nomine Cagado in campis et nemoribus campestribus Bahiæ.

ORDO IV. RANÆ.

Animalia in statu embryonis apoda, caudata, branchiis respirantia, metamorphosi peracta tetrapoda, exunguiculata, ecaudata, nudiuscula, in aqua vel locis humidis degentia, tempore matatino, vespertino necnon nocturno conclamitantia, pulmonibus laryngeque arteriâ asperâ destituto respirantia, mas pene non exstructus, fœminæ crassiori insidens, ovula modo exclusa, rotunda, mollia, inter se conglutinata semine aspergendo fecundans; palmis tetra, plantis penta-dactylis, ventriculo auriculâque cordis imparibus, linguâ antice connatâ, postice subliberâ.

Genus I. RANA.

Corpore plerumque lævi; *parotidibus* nullis; *maxillâ* superiore denticulatâ; *pedibus* longioribus; *digitis* omnibus elongatis, cylindricis, plerumque non palmatis, apice non fimbriatis.

Species 1. R. GAGAS.

Maxima, fusco-olivacea vel virescens, subtus et in hypochondriis flavicanti-maculata; ano supero; taeniâ utrinque pone oculum et alterâ ad latera dorsi geminis, nigris, granulosis.

Habitat in locis paludosis fluminis Amazonum.

Species 2. R. PACHYPS.

Chalybeo-fusca, subtus pallide flavicans; dorso obscure sexlineato, maculis oblongis nigricantibus picto; capite gibbo; maxillâ inferiore flavo nigroque fasciatâ; plantis subpalmatis; humero

maris intumido; rudimento digiti palmæ quinti interioris tuberculato.

Habitat in locis humidis Provinciæ Rio de Janeiro.

Species 3. *R. MYSTACEA.*

Mediocris, cœrulescens; tænia per tympanum versus nares et ad maxillam superiorem nigrâ, aliâ utrinque intermediâ albâ; maxillâ inferiore nigro-marginatâ; dorso immaculato, nigro bipunctato et obscure nigro alboque bilineato: ano supra et lateraliter albo-lineato; digito plantæ intermedio exteriori perlongiore.

Habitat ad Bahiam in aqua fluviali; differt ab illa prope flumen Solimoëns stria inter oculos, nares et tympanum magis coarctata, lineis dorsi anique magis obscuris, albis (An Fœmina?) Specimina 2.

Species 4. *R. MEGASTOMA.*

Rufo-fusco nigricans, Bufoni similis, semipalmata; capite et ore grandissimis; palpebris membranose cornutis; dorso medio pallidiore, laterali utrinque maculis, tribus, cordiformibus, echinatis.

Habitat, Cururuacu appellata, in Brasilæ sylvis sub arboribus cavis.

Species 5. *R. SCUTATA.*

Olivaceo-fuscescens; capite subgrandi, scutato, toto osseo; palpebris breviter cornutis; linguâ rotundatâ; pone non excisâ.

Habitat in sylvis fluvii Solimoëns.

Species 6. *R. PALMIPES.*

Olivaceo-fuscescens, subtus fulvo-brunnea; digitis palmæ brevibus, liberis, plantæ longis, largè palmatis; capite et dorso planis; pedibus, præcipuè posterioribus fulvo nigroque marmoratis.

Habitat, Gutaca vulgo nominata, in aquis stagnantibus fluminis Amazonni.

Species 7. *R. CORIACEA.*

Cinnamomea; membranâ hypochondriorum pone crassiore,

coriaceâ; digitis plantæ brevibus, bufoninis, liberis, subtus tuberculatis.

Habitat in aquis lacustribus fluvii Amazonum.

Species 8. *R. MILIARIS.*

Gracillima, supra nigricans granulis punctisque albis munita, subtus cinerascens, albo punctata, postice ad femora cœrulescenti-variegata.

Habitat ad ripam fluminis Amazonum.

Species 9. *R. PYGMAEA.*

Fusco-brunnea, pygmæa; dorso subgibbo; femoribus crassis, nigro-fasciatis; abdomine irregulariter rufo lineato.

Habitat in Provincia Bahiæ.

Species 10. *R. LABYRINTHICA.*

Olivaceo-fusca; capite pantherino; dorso nigro-pustulato et maculato; abdomine albo, lituris labyrinthicis, nigro-brunneis variegato.

Habitat in Provinciâ Rio de Janeiro.

Species 11. *R. BINOTATA.*

Brunneo-fusca, hylæformis, subtus cinerascens; maculis in medio dorso geminis, ocellatis, nigris; striâ supra tympanum, inter oculos ac nares nigrâ.

Genus II. *HYLA.*

Nuda, in arbustis frequenter vivens; digitis pedum subpalmatis, apice depressis, fimbriatis: parotidibus nullis.

Descriptio. Corpus depressum, nudum, non verrucosum, gracile, postice attenuatum, supra frequenter vivis lætisq; coloribus pictum; oculi protuberantes; maxilla superior denticulata; tympanum conspicuum; lingua rotunda, antice connata, postice non excisa; parotides nullæ; pedes longi, graciles, semipalmati; digiti omnes depressi, frequenter subæquales, apice fimbriati.

Species 12. *H. RANOIDES.*

Exigua, fusco-nigricans; abdomine nigro-cinereoque lineolato; pedibus posterioribus supra fuscis, nigro fasciatis; digitis ranæformibus, elongatis, non palmatis, apice vix fimbriatis.

Habitat in Provincia Bahiæ. Specimina 3.

Species 13. *H. LATERISTRIGA.*

Exigua, brunnescens supra, subtus flavicans; striâ inter utrumque oculum transversâ, nigrâ, aliâ ad latera dorsi fulvâ; maculâ pone tympanum nigrâ.

Species 14. *H. ALBOPUNCTATA.*

Exigua, supra rosea, subtus albicans; maxillis et tarso albo-marginatis; femoribus postice nigris albo punctatis.

Species 15. *H. AFFINIS.*

Mediocris, supra fusco-nigricans, subtus cinerascens; femoribus pone cœruleo-oculatis; digitis apice large fimbriatis, posterioribus large palmatis.

Habitat ad ripam fluminis Amazonum.

Species 16. *H. ALBOMARGINATA.*

Subexigua, supra rufo-brunnea, nigro-punctulata, inter oculos, tympanum, necnon pone tarsum et anum albo-marginata, subtus cinereo-alba.

Habitat in Provincia Bahiæ.

Species 17. *H. PAPILLARIS.*

Minor, supra cinerascenti-rosacea, albo punctulata, subtus nigricans, medio alba, palpebris anoque albicantibus.

Habitat sub foliis in sylvis prope Ecgam ad flumen Solimoëns.

Species 18. *H. PARDALIS.*

Major, supra brunneo-grisea, subaspera, subtus fulvo-alba; hypochondriis femoribusque nigro-fasciatis; digito minimo sive quinto palmæ pedis subconspicuo, connato.

Habitat in Provincia Rio de Janeiro.

matiss et fimbriatis; dorso medio longitudinaliter late cinnamomeo.

Habitat in arbustis et arboribus ad flumen Tefé.

Species 33. *H. DUFONTA*.

Grandis, nigro vel chalybeo-fusca, subtus fulva, granulosa; digitis plantæ late fimbriatis; pollice palmæ subcrasso, nigro.

Habitat prope Ecgà in sylvis.

Species 34. *H. BICOLOR*.

Maxima, cærulea, utrinque ad latera lineâ ocellisque albis marginata, subtus fulva.

Habitat sub nomine, "Gutaca" prope Tonantin, flumen laterale fluvii Solimoëns.

Genus III. *BUFO*.

Corpore verrucoso; *dentibus* maxillaribus nullis; *parotidibus* extus conspicuis, crassis; *digilis* apice non fimbriatis, anterioribus divaricatis, posterioribus abbreviatis, palmatis.

Descriptio. *Corpus* obtusum, subgibbum, verrucis maculisque obscurioribus horridum; *caput* osseum, elevatum, supra angulate marginatum; *maxillæ* edentatæ; *lingua* elliptica, pone libera, non excisa; *tympaenum* conspicuum; *parotides* extus conspicuæ, crassæ; *pedes* breviores; *digiti* planiusculi, non lenticulati, posteriores breves, inæquales, subpalmati.

Species 35. *B. MACULIVENTRIS*.

Grandis, olivaceo flavo-virescens, subtus virescenti-flavicans, maculis nigris variegatus.

Habitat, Xué cognominatus (Sapo de Boy), in sylvis et aquis paludosis ad ripam fluminis Solimoëns.

Species 36. *B. AGUA*.

Giganteus, supra olivaceo-brunneus, subtus immaculatus.

Habitat, Xuéacu appellatus, prope Marabitannas in sylvis ad ripam fluvii nigri.

Species 37. *B. ICTERICUS.*

Grandis, cacaotico-brunnescens, lineâ dorsi medii longitudinali, maculisque irregularibus albo-flavis, supra et subtus variegatus.

Habitat in sylvis et arboribus cavis Provinciæ Rio de Janeiro, noctu voce rauca ululans.

Species 38. *B. ORNATUS.*

Mediocris, olivaceo-virescens; dorso medio longitudinaliter fulvo-lineato, lateraliter nigro-maculato; pedibus palmatis.

Habitat in Provincia Rio de Janeiro.

Species 39. *B. LAZARUS.*

Grandis, olivaceo-virescens, verrucis nigro-punctulatis hispidus; digitis apice nigricantibus.

Habitat in sylvis fluvii Amazonum.

Species 40. *B. DORSALIS.*

Mediocris, olivaceo-brunnescens; dorso medio longitudinaliter fulvo-lineato, nigro non maculato.

Habitat *Bufoni scalero* et *ornato* affinis in Provincia Rio de Janeiro.

Species 41. *B. STELLATUS.*

Grandis, nigricans, lævis; hypochondriis femoribusque auran-
tio-maculatis.

Habitat in Provincia Bahiæ.

Species 42. *B. ALBICANS.*

Submediocris, brunnescenti-albicans; maxillis albo-maculatis; femoribus nigro brunneo-fasciatis; dorso laterali nigro-strigilato.

Habitat ad flumen Nigrum.

Species 43. *B. SCABER.*

Mediocris, fusco-ochraceus, verrucis exiguis, multiporosis, nigro-punctatis hispidus; dorso non lineato, nec maculato; femoribus postice aurantio-punctulatis.

Habitat in Provincia Rio de Janeiro, specimini a Daudinio pag. 94, monstrose depicto haud dissimilis.

Species 44. B. EPHIPPIMUM.

Minutus, cœrulescenti-ochraceus; capite supra dorsoque medio nigro-fasciatis; maxillis oculisque nigro marginatis; tympano nigro.

Habitat in Provincia Bahiæ.

Species 45. B. ALBIFRONS.

Exiguus, læviusculus, albicans, nigro-maculatus; fronte albicante; maculâ dorsi medii albâ, aliis dorsi postici geminis nigris; digitis non palmatis; parotidibus vix conspicuis.

Habitat in Provincia Bahiæ.

Species 46. B. GLOBULOSUS.

Mediocris, gibboso-globulosus, supra nigro-maculatus, fusco-brunnescens; pedibus brevioribus; femore cum lumbis connato.

Habitat ad flumen Itapicuru.

Genus IV. OXYRHYNCHUS.

Corpore bufonino, non verrucoso sed granuloso; *capite* brevi, acute rostrato; *maxillâ superiore* pone angulato-elevatâ; *femoribus* cum lumbis connatis; *parotidibus* exiguis, vix conspicuis.

Species 47. O. NARICUS.

Subexiguus, brunnescens; rostro brevi, subprominulo; maxillâ pone minus elevatâ; pedibus nigro-fasciatis; abdomine pallide brunneo, immaculato.

Habitat ad flumen Amazonum.

Species 48. NASUTUS.

Subexiguus, fusco-brunneus, granulis subhispidus; rostro acute prominulo; maxillâ pone acute angulatâ et elevatâ; occipite minus largo, lateraliter fasciato et bicristato; pedibus large nigro-fasciatis; tarsis subtus nigris, lateraliter crenulatis; abdomine fusco-maculato sive punctato.

Habitat ad flumen Amazonum; an *Bufo nasutus* Schneideri?

Species 49. O. SEMILINEATUS.

Subexiguus, nigro-cinereus; capite supra orbitam subcristato,

supra tympanum utrinque foveato; lineâ dorsi posterioris medii longitudinali albicante; pedibus longis, nigro-fasciatis.

Habitat ad flumen Itapicuru.

Species 50. *O. GRANULOSUS.*

Subexiguus cinnamomeus, granulis punctisque nigris subhispidus; pedibus nigro, abdomine rufo-fusco maculatis; rostro minimo, acuto; maxillâ pone vix elevatâ.

Habitat in Provinciâ Bahiæ.

Species 51. *O. ACUTIROSTRIS.*

Subexiguus, brunnescens, acutirostris; dorso medio longitudinaliter fulvo-lineato nigroque marmorato; maxillâ superiore pone elevatâ; tympano supra angulato.

Habitat ad flumen Amazonum.

Species 52. *O. PROBOSCIDEUS.*

Subexiguus, niger, rostro proboscideo, longe prominente.

Habitat ad flumen Solimoëns.

Genus V. *PIPA.*

Corpus depressum, aculeis brevibus hispidum. *Caput* planum, vix distinctum; *maxillæ* edentatæ; lingua nulla; *oculi* minutissimi; *os* amplissimum, angulatum; *tympanum* parotisque extus non conspicua; *femora* cum lumbis connata; *digiti palmæ* longi, epalmati, recti, apice tetracirrhosi, *plantæ* largissime palmati.

Species 53. *P. CURURU.*

Grandis, supra echinata; mas olivaceo-niger, subtus fulvo-maculatus; fœmina nigerrima immaculata.

Habitat in fundo aquarum lacustrium prope Bahiam et ad flumen Amazonum.

ART. XLI. *On the Genus Psaris of M. Cuvier, with an Account of two new Species.* By WILLIAM SWAINSON, Esq. F.R. & L.S.

THE vast influx of new objects continually coming before us, and a better acquaintance with those already noticed by preceding naturalists, has gradually extended the limits of many genera, originally supposed to consist but of one species. The genus *Psaris* of M. Cuvier remained for some years in this state; being confined to a single species—the *Lanius Cayanus* of Linnaeus; a second was discovered by myself in Brazil, and has been described (under the name of *P. Cuvieri*,) in the first volume of Zoological Illustrations; I am now enabled to augment this group by two other species, very distinct from the preceding, and which seem not yet to have been recorded.

On closely examining these birds, with the view of ascertaining the leading distinctions which separate *Psaris* from the neighbouring genus *Tyrannus*, I have noticed one or two peculiarities which appear to me sufficiently important for this purpose: the following generic characters for the group are therefore proposed.

PSARIS.

Fam. LANIADÆ. Vigors.

Subfam. TYRANNINA.

Rostrum validum, crassum, rectum, culmine rotundato, mandibulæ superioris apice adunco, emarginato; naribus rotundis, nudis, membranâ obsoletâ; rictu inermi.

Alæ elongatæ, remige primo brevior, secundo tertioque longissimis; inter remigem primam et secundam penna brevis, angusta, spuria, interest; pogoniis utrinque emarginatis.

Pedes mediocres, squamis lateralibus numerosis, ovatis.

Cauda mediocris, æqualis vel rotundata.

Bill strong, thick, straight, culmen rounded, upper mandible with the tip hooked and notched; nostrils round, naked, the membrane obsolete; rictus smooth.

Wings elongated; the first quill rather shorter than the second and third which are the longest; between the first and second is a short narrow spurious quill; the webs on each side of the shafts entire.

Feet moderate; the lateral scales numerous and oval.

Tail moderate, even or rounded.

Generic type, *Lanius Cayanus*, Lin.

The most striking peculiarity of *Psaris* is in the bill; which is little, if at all, depressed, and by its strength and thickness is well calculated for the destruction of small reptiles, and those larger kinds of insects which these birds may probably devour; but this is conjecture, for their economy is at present but little known. The wings are long, and in three species of the group now before me there is a narrow spurious feather inserted between the first and second of the primary quills; whether this character exists likewise in *P. Cuvieri*, I have no means of ascertaining; as the specimen I originally examined has passed into other hands.

Psaris cristatus.

P. fuscus, infra pallidè fulvus; alis ad basin albâ maculâ oblectâ notatis; vertice nigro, subcristato.

Brown, beneath pale fulvous, base of the wings with a concealed white spot; crown black, slightly crested.

Description.

Total length about seven inches. Bill black; front and upper part of the head deep brownish black, the feathers sufficiently lengthened to form a crest; sides of the head and ears greyish brown. The whole of the upper plumage, including the wings and tail, is of a uniform blackish brown colour, but on raising the feathers on the back, there appears a large snowy spot on those immediately adjoining the base of the shoulder, and which are of a soft downy texture. The under parts are fulvous, tinged with

grey on the body, and becoming almost white on the chin : inner wing coverts deep fulvous. Wings moderate, the first and fourth quills are of equal length ; the second and third are the longest, and are also equal. The spurious quill, which seems a peculiar characteristic of this genus, is rather broad, except near its apex, where it becomes suddenly narrowed, and terminates in a point : the inner margins of all the quills, towards their base, are white : the tail, in a very slight degree, is rounded, the two exterior feathers on each side being somewhat shorter than those in the middle ; tarsi black.

I received a single specimen of this bird from the southern part of Brazil, sometime ago ; it was stated to be a male. The patch of soft downy feathers on the back, a character so frequent among the African *Malaconoti* is entirely wanting in all the birds of the sub-family *Tyrannina*, which I have hitherto seen.

Total length 7 inches ; bill 1 ; wings 4 ; tail $2\frac{5}{16}$; tarsi $\frac{7}{16}$.

Psaris niger.

P. niger, infrà griseus ; caudæ sub-graduatæ, nigræ, apice albo.

Black, beneath grey ; tail slightly graduated, black, tip with white.

Description.

Nearly the size of *Psaris Cuvieri*. Bill blueish black, the nostrils are rather large, and covered by a membrane, at the extremity of which is placed the aperture ; the whole being protected, and nearly concealed, by slightly incumbent feathers, intermixed with weak bristles. The front and upper part of the head are deep black, with a gloss of steel blue, which gradually disappears ; grey on the neck and middle of the back : the rump and upper tail coverts are dark grey ; the wings are black ; the white tips of the greater and lesser coverts forming two unequal bands ; the margins of the scapulars and of the lesser quills are also white. All the under plumage is dark grey, verging towards black on the throat and breast. The wings are of a less pointed form than those of *P. cristatus* ; the first quill is shorter than the fourth, and the intermediate spurious quill is abruptly emarginate

close to its extremity. The tail is black, the four middle feathers are nearly of equal length, and are terminated by a small spot; the next pair are rather shorter; but the two lateral pair are considerably graduated, and broadly tipped with white; the tarsi are black; and, in proportion to the size of the bird, are rather long.

Total length, $5\frac{1}{4}$; bill, $\frac{7}{16}$; wings, 3; tail, middle feathers, $2\frac{1}{4}$; outer feathers, scarcely 2; tarsi, $\frac{7}{8}$.

I am quite ignorant of the locality of this species, my specimen having been purchased at an auction, in a lot with other skins from various countries. It differs from all the *Laniadæ* of the New World, in having that peculiar kind of metallic lustre on some parts of its plumage, which is so general among the Drongo Shrikes of Africa and India; while in the graduated form of the tail, it resembles the American *Thamnophilinæ*, and presents a solitary example of such a structure among the *Tyranninæ*. The membranaceous covering of the *nares*, and the setaceous feathers by which they are protected, are further deviations from the typical characters. Yet, setting these peculiarities aside, the more essential characteristics of *Psaris* are so well preserved in the form of the bill, the sculpture of the tarsi, and the relative proportions of the quill-feathers, that no doubt can remain as to its connection with this group; and consequently, there is every reason to believe it may be a native of South America.

ART. XLII. *On the Isocardia Cor of the Irish Seas.* By
the Rev. JAMES BULWER, F.L.S., &c.

[In a Letter addressed to G. B. Sowerby, Esq.]

DEAR SIR,

IN the early part of last autumn (1824), I had the good fortune to procure a considerable number of specimens of the *Isocardia Cor*, taken by trawling in very deep water on the east coast of Ireland; many of the specimens were brought to me with the included animals alive and healthy: thus giving me an opportunity of examining and delineating them in their native element.

Should the few observations I then made, and which I now enclose, appear to you to be worth inserting in the *Zoological Journal*, you are at liberty to give them a place whenever you please.

I remain, dear Sir,

Yours, faithfully,

JAMES BULWER.

ISOCARDIA. Lamarck.

Testa æquivalvis, cordiformis, ventricosa; umbonibus distantibus, divaricatis, involutis. Dentes cardinales duo, compressi, intrantes, unus sub utroque umbone recurvus. Dens lateralis posticus elongatus.

Ligamentum externum, divaricatum, segmentis sub umbonibus decurrentibus.

Impressiones musculares duæ, laterales, distantes. Impressio muscularis pallii sinu nullo.

SPEC. *Isocardia Cor*. Lamarck, Anim. sans vertèbres. tom. vi. p. 31. 1.

Chama Cor. Linn. Gmel. p. 3299.

——— Montagu Test. Britannica, &c. &c.

I. testâ cordato-globosâ, lævi, fulvâ, umbonibus albidis fusco fulvoque nebulosis.

ANIMAL.—*Pallium* amplum, testæ faciem interiorem omnino tegens; externo margine duplice est; plicâ exteriori anticè divisâ, inferiore fronte conjunctâ utrâque extremitate apertâ; posticè duobus brevibus siphonibus vel tubis ciliatis foraminibus superioribus facit;—color flavido-albus margine aurantiaco.

Pes valde muscularis, latus, triangularis, compressus, cuspidatus, aurantiacus.

Branchiæ subflavæ, externæ, inter pallio et abdomine celatæ.

Corpus molle testæ valvis omnino inclusum.

ANIMAL.—*Mantle* completely lining the shell, double at the outer edge: exterior fold divided in front: interior united in front, open at each end: at the posterior end forming two short siphons or tubes, ciliated at the upper orifices; colour yellowish white; margin orange.

Foot very muscular, broad, triangular, compressed, pointed, orange.

Branchiæ, external, concealed between the mantle and the body.

Body soft, completely included within the valves.

On being placed in a vessel of sea water the valves of the shell gradually opened, to the extent represented in the drawing: the feelers or ciliated fringe of the upper orifice (*a*) of the mantle moved slowly, as if in search of animalculæ. Having remained in this situation about ten minutes, water was ejected with considerable force from the lower orifice, (*b*) which had till now remained motionless. The expulsion of the water appeared to be effected by a sudden contraction of the muscles, because this was never done without the valves nearly closing at the same instant. After a few seconds the valves gradually returned to their open position, and remained quiescent as before, till the water was again ejected with a jerk; this alternating process was repeated at unequal intervals during the whole time my specimens were under examination, but at shorter intervals on receiving fresh supplies of sea water, when I suppose food (its quality I could not ascertain) was more abundant.

The animal appears to be insensible both to sound and light, as the presence or absence of either did not at all interrupt its movements; but its sense of feeling appeared to be very delicate, minute substances being dropped into the orifice of the mantle instantly excited the animal, and a column of water strongly directed expelled them from the shell. With so much strength was the water in some instances ejected, that it rose above the surface of three inches of superincumbent fluid. Animal small in proportion to its shell, occupying when dead barely a third of the space enclosed in the valves. Its mantle is slightly attached to the shell, and to the epidermis at the margin, and appears to be

kept distended, and in contact with the interior of the valves, by the included water.

The valves fit so closely that the animal can remain two days or more without permitting a single drop of fluid to escape.

Locomotion very confined; it is capable with the assistance of its foot, which it uses in the same manner (but in a much more limited degree) as the *Cardiacea*, of fixing itself firmly in the sand, generally choosing to have the umbones covered by it, and the orifices of the tubes of the mantle nearly perpendicular.

Resting in this position on the margin of a sand bank, of which the surrounding soil is mud, at too great a depth to be disturbed by storms, the *Isocardia* of our Irish sea patiently collects its food from the surrounding element, assisted in its choice by the current it is capable of creating by the alternate opening and closing of its valves.

Some of the specimens that had been taken four or more days before they were brought to me, exhibited on dissection the following curious appearance:—On removing the mantle from the surface of the shell, a considerable quantity of shelly matter of the consistence of thick cream, or like moistened plaster of Paris, was discovered; on a nearer inspection, the interior layers of its shelly covering were found to be deeply corroded in parallel furrows, in some spots so deeply that the brown or outer layers of the shell were laid bare. This shelly matter had undergone no change but that of trituration. To what cause is this appearance to be attributed? Are the animals of this species when in a state of starvation, as these probably were, capable of absorbing a portion of their shell (the gluten), and converting it into nourishment? Or do the animals, when languid and unhealthy, secrete a menstruum that destroys the cohesion of the particles of which their habitations are formed? In none of the living specimens that I had an opportunity of examining, did I detect any parasite; while in nine out of ten specimens of the *Cyprina Islandica* from the same neighbourhood, I found a small *Hirudo* lurking under the mantle of each, and in very many specimens of a *Modiola* from the shallow water of the same coast, a small crab (*Pisa*) shared the habitation with the animal.

Since committing the above observations to paper, I have seen the costly and elaborate work of Poli; containing among other investigations, an account and anatomical drawings of the animal of the *I. Cor* of the Mediterranean. On inspecting these a considerable difference between the animals of the foreign and Irish species is observable; but whether sufficient to authorize the separation of the shells I leave for abler conchologists to determine.

The foot of the Mediterranean species is much less pointed, shorter, less rugose, and of a somewhat different* and lighter colour than the same part in our animal. The margin of the mantle in Poli's figure is strongly serrated, and of the same† ferruginous hue as the rest of the animal; in ours it is plain, and in the healthy animal of a bright orange, while its body is of a yellowish-white. The Mediterranean Molluscum belongs to Poli's genus *Glossus*, and is thus shortly defined,—

Glossus. *Tracheæ* ‡ binæ foraminiformes.

Branchiæ ultra abdomen simul conjunctæ.

Abdomen ovato-compressum, pes linguiformis.

The shell constitutes his genus *Glossoderma* (*G. Cor.* Poli.)

* Pes miniaceo colore rutilans. Poli.

† Limbus (pallii) ferrugineo colore infectus. Poli.

‡ *Tracheæ* ferrugineo colore illitæ. Poli.

ART. XLIII. *Description of some new British Shells; accompanied by figures from the original Specimens.*
By Dr. TURTON.

|| 1. *GALEOMMA Turtoni.*

Char. Gen. Testa bivalvis, æquivalvis, æquilateralis, transversa; margine antico ovato-hiante. Cardo edentulus. Ligamentum internum.

|| Dr. Turton had omitted to give a specific appellation to this shell, probably supposing it to be the only species known. Mr. Sowerby however in-

Shell bivalve, equivalve, equilateral, transverse; with a large oval gape at the front margin. Hinge without teeth. Ligament internal.

Length two lines and a half; breadth not quite half an inch.

This new and very singular bivalve, we dredged up in the English Channel, alive, during a gale of wind. The shell is very tumid in the middle, and gradually sloping to the sides, which are rounded and closed. The colour is of a dull milky white; and the surface covered with short, close-set, transverse, interrupted, opaque lines, very irregularly disposed, and which give the margin a serrated appearance. The beaks are rather prominent and central; the cardinal margin running nearly straight; but the front margin a little rounded, with a large oval eye-like transverse gape, extending the whole breadth.

In the Linnean arrangement it would rank with the *Myæ*. Dr. Goodall, who carefully examined our specimen, thinks he has somewhere seen a single valve, which from the peculiar markings of the surface, cannot be mistaken for any other known shell.

Icon. tab. xiii. fig. 1.

Mus. nost.

2. LIMA TENERA.

Testâ compressâ, inæquilaterali, utrinque hiantè; latere antico subtrigono, peritremate intus marginato: costis 25; subundatis, læviusculis; margine serrato; cardine obliquo.

Shell compressed, inequilateral, open on both sides; the anterior side somewhat triangular, with the aperture margined internally: ribs 25, somewhat undulated, and nearly smooth: the margin serrated; and the hinge oblique.

Length an inch; breadth five eighths of an inch.

This shell does not seem to agree exactly with any of the species described by authors. It differs from the *Lima Loscombi*, our *L. bullata*, in being much more depressed; in having fewer

forms us that he has two other species, one from the Mauritius and the other from Van Diemen's Land; it is therefore necessary that a specific name should be given to this species, and we have chosen *Turtoni*, in honour of the first describer of the genus.—*Editors.*

ribs, without intermediate smaller ones ; in the greater angularity of the anterior cardinal margin ; in the wide gape on both sides ; and in the strong internal rib round the anterior opening : and from *L. bullata* of Sowerby, in the obliquity of the hinge.

We dredged up half a dozen living specimens, of various sizes, in the British Channel. They had no byssus attached to them, nor has the *L. Loscombi*, when taken alive.

Icon. tab. xiii. fig. 2.

Mus. nost.

3. *PHYSA ALBA*.

Testá sinistrorsá, ovatá, ventricosá, albo-corneá, pellucidá ; anfractibus quatuor, tumidis, exsertis : aperturá ovatá.

Shell sinistral, oval, ventricose, white horn-colour, transparent ; volutions four, tumid and produced.

Length four tenths of an inch ; breadth about three tenths.

This very distinct species is found in the river Towin, in North Wales. In the tumidity of the volutions and the obliquity of the sutures, as well as in its colour, it differs from any species yet described. The *Ph. rivalis* is oblong, of a yellow horn-colour, with the volutions very little raised or swollen, and the aperture is oblong. In fig. 2. tab. 4. of the 8th Vol. of the Linnean Transactions, *Ph. rivalis* is erroneously represented as a dextral shell.

Icon. tab. xiii. fig. 3.

Mus. nost. Blomer.

4. *BULIMUS TUBERCULATUS*.

Testá ovata-oblongá, albido-fuscá, basi lacteá subumbilicatá : peritremate lacteo, subreflexo : aperturá supernè uni-tuberculatá.

Shell oval-oblong, whitish-brown, white and somewhat umbilicate at the base : margin of the aperture white and slightly reflected, with a single tubercle at the upper and outer angle.

Length half an inch ; breadth three-tenths.

A very beautiful species, in size between the *B. montanus* and *B. obscurus*, found at Pershore in Worcestershire. In colour it varies from milk-white to brownish-white, but the lower half of

the larger volution is always milk-white as well as the margin of the aperture. It has six volutions, which are flatter than in either of the two above mentioned; and is remarkable in its genus for the white tubercle seated near the upper and outer angle of the aperture.

Icon. tab. xiii. fig. 4.

Mus. nost. Blomer.

5. CREPIDULA SINUOSA.

Testâ orbiculo-oratâ, lævi, lacteâ, immaculatâ; margine sinuato.

Shell roundish oval, smooth, entirely milk-white; with the margin sinuate.

Length half an inch; breadth four-tenths.

Found at Scarborough, in Yorkshire, by Mr. Bean. The outer surface is polished, and under a glass appears to be very finely and irregularly striate transversely: but it has no ribs, nor prickles, nor colourings of any kind.

Icon. tab. xiii. fig. 5.

Mus. nost. Bean.*

6. BULLA ALBA.

Testâ ovatâ-oblongâ, longitudinaliter striolatâ, albâ, immaculatâ; vertice umbilicato; extremitatibus striis transversis tribus punctatis.

Shell oval-oblong, slightly striate longitudinally, entirely white; crown umbilicate: at each extremity three transverse punctured striæ.

Length

breadth

We dredged up half a dozen of these shells in the British Channel, all dead. They are more elongated than the *Bulla Ampulla*, and essentially differ in having only three rather remote transverse striæ at each end, whereas on the latter shell there are

* We cannot agree with Dr. Turton in placing this *Crepidula* on the British List, as Mr. Bean informed us that he took it from the bottom of a ship just arrived from North America.—*Editors.*

seven or eight striæ on the lower extremity, and none on the upper.

Icon. tab. xiii. fig. 6.

Mus. nost.

7. *TRITONIA VARICOSA*.

Testâ conicâ, albidâ rufo maculatâ, varicibus subtribus albis : anfractibus 7, planiusculis, decussatis : aperturâ purpureâ, utrinque dentatâ ; columellâ extus albâ.

Shell conic, whitish with rufous marks, with two or three white varices : volutions seven, flattish and decussate : aperture purple, toothed on each side ; pillar white externally.

Length six-tenths of an inch ; breadth four-tenths.

Our notice was first attracted to this species, by Mr. Griffith. They are dredged up in a particular spot in Torbay, always preserving their exact character as distinct from *Tr. macula*, which is never found with it. All the varieties of the latter species have the throat white, with a dark purple spot in the centre of the base.

We have ventured to change the generic name of Lamarck, from *Triton* to *Tritonia*, the former appellation having been given by Linné, to a family of naked mollusca.

Icon. tab. xiii. fig. 7.

Mus. nost. Griffiths.

8. *PURPURA PICTA*.

Testâ ovato-oblongâ, nitidâ, albidâ lituris ochraceis : anfractibus 8, decussatis : labro lævi.

Shell oval oblong, glossy, whitish with ochraceous blotches : volutions eight, decussate : outer lip smooth.

Length four-tenths of an inch ; breadth hardly two.

Some of this species we dredged up in the British Channel. From the pointed termination of the pillar, they appear to belong to this genus rather than to *Buccinum* or to *Fusus*. When

fresh, the ochraceous marks are very vivid, and mostly disposed in reticular masses.

Icon. tab. xiii. fig. 8.

Mus. nost.

9. BUCCINUM OVUM.

Testá ovatá, inflatá, tenui, eburnéa, lævi; anfractibus sex, tumidis: labro tenui, lævi.

Shell oval, inflated, thin, ivory-white, smooth; volutions six, tumid: outer lip thin and smooth.

Length an inch and three-quarters; breadth rather more than an inch.

This very curious shell, a duplicate of which we have never seen, was dredged up off Plymouth. It very much resembles the *Buccinum novum Grælandicum* of Chemnitz, x. p. 182. tab. 152. f. 1448.; but that shell is represented as of a blueish colour, and marked with remote transverse striæ: the volutions also of Chemnitz's shell appear to be not so much raised.

Icon. tab. xiii. fig. 9.

Mus. nost.

10. TURBO FABALIS.

Testá subglobosá, obtusissimá, lævi; anfractibus tribus, viz productis; castaneá, fasciis obscuris pallidis; columellá et fauce castaneis.

Shell subglobular, very obtuse, smooth, with three hardly produced volutions; of a chesnut colour, with obscure pale bands: pillar and throat chesnut.

Diameter about a line.

Found on the rocks at Scarborough, by Mr. Bean. It is often covered with a gray coat which hides its colours and marks: the bands are about twelve in number, apparently interrupted, so as to give the surface a chequered appearance; and under a very good glass it seems very finely striate circularly. It is twice the size of *T. fulgidus*, and more obtuse than any of its genus.

Icon. tab. xiii. fig. 10.

Mus. nost. Bean.

11. PHASIANELLA STYLIFERA.

Testâ ovatâ, lutescente-corneâ, pellucidâ, lævissimâ : anfractibus 5, duobus basâlibus ventricosis, tribus apicalibus abruptè minimis : operculum nullum.

Shell oval, yellowish horn-colour, transparent, quite smooth ; volutions 5, the two lower ones very tumid, the three terminal ones abruptly minute : operculum none.

Length a line ; breadth not so much.

We found a dozen of these beautiful little shells alive, and attached to the spines of the *Echinus esculentus*, dredged up in Torbay. The aperture is suborbicular, with the margin disunited at top, and extremely thin : towards the pillar side, the colour becomes more intensely rufous : and the sudden and extremely minute volume of the three apical volutions, in this respect resembling the *Voluta bulloides*, distinguishes it from all the other minute turbinated shells.

In endeavouring to apportion the British Catalogue according to the arrangement of Lamarck, it is no very easy matter to fix the genera of many of the smaller turbinated shells, without indulging in a greater latitude of character than that author and his followers have as yet admitted. Sowerby confines the character to such only as have a calcareous operculum : Lamarck to such as have the operculum either calcareous or horny : to prevent the excessive multiplication of genera, ourselves, for the present, combine with the *Phasianella* such as otherwise answer to Lamarck's character, whether they have an operculum or not : and such as have the margin of the aperture united all round, we cast into the new genus *Cingulus*, after Dr. Fleming.

Icon. tab. xiii. fig. 11.

Mus. nost. Goodall, Bingham, Lyons.

ART. XLIV. *Sketches in Ornithology; or, Observations on the leading Affinities of some of the more extensive groups of Birds.* By N. A. VIGORS, jun. Esq. A.M. F.L.S.

(Continued from p. 197.)

ON THE GROUPS OF THE VULTURIDÆ.

THE mode in which Nature regulates the numbers of the animal kingdom according to size, restraining those of the larger subjects within moderate limits, and compensating by the multitude of the smaller for their inferiority in bulk, is too generally observable to need more than a mere reference to the fact. In those departments of Zoology, it is true, which comprise the animals that are chiefly necessary to man's support, such as the *Herbivorous Mammalia*, and the *Gallinaceous Birds*, some modification of this general law takes place. Here the peculiar fecundity bestowed upon some species, and the facility of domestication in all, renders their powers of production more extensive; and although the variety of forms in such groups is diminished in the inverse ratio of their size, yet the number of individuals may be so far multiplied as to answer all the conveniences and supply all the wants of man. Among those animals, however, whose business it is to restrain the luxuriance of nature, either in the animal or vegetable world, and either in its living or decaying state; whose work in fact is a work of destruction—theirself the agents of prey, more than the objects of prey to others—the general law prevails without any reserve or modification. Thus in these predacious animals the variety of forms among the larger tribes is universally found to be limited; the species are few; and the individuals not numerous. While on the other hand where the dimensions of these animals are small, the multitude of forms, of species, and of individuals, is without any apparent limits. By their overpowering numbers they supply the inefficiency of their individual labours; in silence and in secrecy they pursue their work of destruction; and their unobtrusive agency is perceptible only in the magnitude of the effects which they produce.

It is evident that it is among these last mentioned groups whose limited size and powers admit of a greater multiplicity of form, that the inquirer into natural affinities will find the most favourable field for his researches. Here the series of affinity may justly be supposed to run on without any interruption, and the innumerable species to blend into each other without almost any perceptible change of character. It is this circumstance perhaps which gives to Entomology its peculiar interest, and confers upon the minute and microscopick creatures, which form the subject of that science, a value in the eye of the naturalist, which is denied to the more bulky and apparently nobler animals. In these larger sized groups the transition on the other hand from form to form is more abrupt, the interchange of character is more irregularly marked, and although the naturalist may trace out the general approximation by which the series of affinity is still preserved inviolate among them, his eye is not gratified by that immediate and perfect bond of connection which it is enabled to detect in those smaller sized tribes, where numbers and variety of form predominate.

The family of *Vultures* comprises a group in which this law is strongly exemplified. Exceeding all other birds in size, unless perhaps we except some of the larger forms of the *Struthionidæ*, and surpassing all without exception in strength and powers of body, these ministers of rapine are necessarily restrained within such limits with regard to their numbers, as prevent their becoming themselves an equal nuisance to the habitable world as that from which it is their business to relieve it. The species and the modifications of character among them are consequently few. These modifications however are so strongly marked as to have formed the foundation of a few well defined generick groups which have been established by some of our most distinguished modern naturalists. Of these groups it is my intention to exhibit a general sketch in the present paper; while at the same time I shall endeavour to point out the affinities by which they are connected together in their own circle, and the typical characters by a greater or less accordance with which they are respectively more or less remotely separated from the neighbouring families. It is a general outline only however that I shall attempt to give of these

forms. The species are as yet too ill defined to enable us to extricate them from the confusion into which our ignorance of their variations in plumage according to age and sex has involved them ; while the usual deficiency of subjects for examination which the British student has so frequently cause to lament, equally serves to exclude all pretensions to accuracy in the details of the family. I shall therefore only venture to point out those well known forms which afford us certain grounds for observation.

It may be in general observed that in the higher latitudes, where an inferior degree of heat does not demand the same rapid decomposition of animal substance as in the warmer climates, the process of destruction, as far as it involves animal agency, is comparatively speaking slow and gradual, and is carried on by those weaker agents, who, as I before observed, by their numbers only counterbalance their inferiority in size. When on the other hand a more powerful influence of the sun calls for a more instantaneous removal of offensive matter, the same work is performed by agents of greater powers and more rapid execution. It is in such tropical climates that the *Vultures* are chiefly observed to exist ; chiefly I say, as although they are sometimes found in higher latitudes, and particularly some of the *aberrant* species of the family, it is within the tropicks that they abound in the fullest numbers, and with the most extensive powers. There they may be noticed as performing a conspicuous part. Their food is chiefly animal substance in a decaying state,* and their business in nature is to clear away with rapidity that mass of putrifying matter, which, if left to a more gradual course of decomposition, would be the forerunner of pestilence and death.

* This mode of feeding draws a marked line of distinction between the present family and that of the *Falconidæ* ; the latter preying only on living animals. These habits thus distinguishing the two groups, were not unnoticed by the ancients. “ὁ γυψίς,” says Plutarch, “ἐπὶ τὰς σμᾶς τῶν διεφθόρουτων σωμάτων φρονταί, τῶν δὲ καθαῶν καὶ ὑγιαίνοντων αἰσθησὶν οὐκ ἐχέσιν.” De cap. ex hostib. utilit. Tom. VI. p. 324. Ed. Reiske.—“ὁ δεινὸς ἀπτεται [γυψί] ζῶντος, καὶ ἀποκτείνουσι ἐμψυχον ἔθνη, ὡς αἰτοὶ καὶ ἱερακίς καὶ τὰ νυκτινομα' χρῆσθαι δὲ τοῖς ἀλλοῖς ἀποθανούσιν.” Questiones

One of the chief peculiarities conferred upon this family, in order to proportion their physical powers to their mode of life; and the nature of their food, is the exquisite perfection of their sense of smelling. Unlike the nobler groups of the conterminous family of *Falconidæ*, which discover and pursue their prey by the piercing powers of their sight,* the *Vulture* is led to his distant quarry chiefly by the acuteness of his scent;—

—— nare sagaci

Æra non sanum, motumque cadavere, sentit.†

Suitably to this purpose, the organs of smell in these birds are strongly developed. Their *nares* are wide and naked, and the bill is frequently surmounted with a fleshy caruncle, which seems to extend the powers and increase the delicacy of these organs. The cere in like manner is considerably dilated. In these peculiar powers the family appears to retain among the *Birds of Prey* the same analogical relation‡ to the *Canine* race among the *Mammalia*, as the conterminous *Falconidæ* exhibit to the *Feline* tribes.

Rom. Tom. VII. p. 152. See also Vit. Romuli. Vol. I. p. 35. Juvenal refers to the same difference in food when illustrating the influence which early habits and education exercise upon men, by a reference to the same influence upon animals.

Vultur, jumento, et canibus, crucibusque relictis,
Ad fætus properat, partemque *cadaveris* affert:
Hic est ergo cibus magni quoque *vulturis*, et se
Pascentis, propriâ cum jam facit arbore nidos.
Sed leporem, aut capream *famulæ Jovis et generosæ*
In saltu *venantur aves*: tunc præda cubili
Ponitur: inde autem, cum se matura levabit
Progenies, stimulante fame, festinat ad illam
Quam primum rupto prædam gustaverat ovo.

Sat. XIV. v. 78.

* “Ex sensibus ante cætera homini tactus, deinde gustatus: reliquis supe-
ratur a multis: *aquilæ clarius cernunt; vultures sagacius odorantur.*” PLIN.
Lib. X. c. 69.

† LUCAN. Phars. VII. 829.

‡ The analogy which the “*odora canum vis*” bears to the power of smell in the *Vultures*, and the similarity of habits that ensues from such qualities,

Another distinguishing character in this family, which equally corresponds with the nature of their food, is the nakedness of the parts about the head. We may in general observe that the effect upon birds of feeding upon flesh, and particularly when it is in a state of decay, is that of producing a falling off of the feathers, or

have long associated these two corresponding groups together as uniting in their work of destruction :

— — — — — πολλὰς δὲ ΚΥΝΕΣ καὶ ΓΥΠΕΣ ἰδονται

Τρωων.

Il. XVIII. 271.

— — — — — ταχὰ κινεῖ ΚΥΝΕΣ καὶ ΓΥΠΕΣ ἰδονται

Κειμένων.

Il. XXII. 42.

Τούτων πολεῖ τῇδ' ἐκκεκρησχαῖ, ταφῇ

Μητε κτερίζειν, μητε κωκύσαι τίνα,

Ἐγὼ δ' ἀδάπτων, καὶ πρὸς ΠΙΘΩΝΩΝ δέμας

Καὶ πρὸς ΚΥΝΩΝ ἰδεστον αἰκίστων τ' ἰδέειν.

Soph. Ant. 203.

Unguibus et rostro tardus trahet ilia *vultur* ;

Et scindent avidæ perfida corda *canes*.

Ovid. Ibis. 169.

Silius Italicus, in referring to an extraordinary custom prevalent in some nations of exposing their dead to the ravages of animals, particularizes these two groups as the agents of destruction.

Tellure, ut perhibent, is mos antiquus Ibera,

Exanima obscænus consumit corpora *vultur*.

Regia cum lucem posuerunt membra, probatum est,

Hyrcanis adhibere *canes*.

De Bell. Pun. XIII. 471.

Lucretius also may be adduced as pointing out the corresponding mode in which both are led to their prey, through the medium of their organs of smell.

— — — — — per auras,

— — — — — longe ducuntur odore

Vulturii cadaveribus ; tum fissa ferarum

Ungula quo tulerit gressum, promissa *canum vis*

Ducit.

De Rer. Nat. IV. 682.

This connection between the two groups seems to have given rise to a sort of proverbial expression, " Si vero naribus nidorem domesticum præsentit, vincit idem sagacitate odorandi et *Canes et Vultures*. APUL. de Magiâ.

at least a thinness in the plumage. This character, although of course not the effect of the food of the *Vultures*, for they exhibit it at all ages, is yet strongly indicative of the nature of it; and when we consider the ravenous and revolting manner of their feeding,* the absence of the feathers of the head and neck appears singularly appropriate to them. It may be noticed, in addition, that this nakedness is more or less extensive over these parts in the different groups of the family, in proportion as their food is more or less exclusively confined to putrid matter.

* The following description quoted by Dr. Latham from Kolben, will shew the mode in which these birds sometimes take their food. "Kolben remarks that an hundred or sometimes more will attack an ox or cow retired from labour, sick, and faint; and falling all at once upon him, soon devour him: they begin by *making a hole in the belly*, and *thrusting in their heads*, pick the flesh from the bones, still leaving the skin to cover them." Gen. Syn. Sup. p. 2. Ed. 1787. The continuator of Wilson's Ornithology, referring to this account of Kolben, confirms the view he gives of the mode of feeding of the *Vultures*. "These — we conjecture to be *Black Vultures*, they being in the habit of *mining into the bellies* of dead animals to feed upon the contents." Am. Orn. vol. IX. p. 101. It was an accurate observation of such scenes in nature that suggested the painful picture of the *Vulture* preying upon Tityus, originally introduced by Homer, and afterwards imitated, or alluded to, by so many succeeding poets.

Και Τίτυον εἶδον, γαίης ἐρικυδέος υἱόν

Κείμενον ἐν δαπέδῳ. —

Γῆπε δὲ μιν ἑκάτερθε παρήμενον ἭΠΑΡ ἔκλειρον,

ΔΕΡΤΡΟΝ ΕΞΩ ΔΥΝΟΝΤΕΣ.

Odyss. XI. 575.

Nec non et Tityon, Terræ omniparentis alumnum,
Cernere erat, —

—— rostro inmanis *Voltur* obunco

Immortale *jecur* tondens, secundaque pænis
Viscera, rimaturque epulis, habitatque sub *alio*
Pectore.

Æn. VI. 595.

Viscera præbebat Tityos lanianda.

Ovid. Met. IV. 456.

Jugeribusque novem qui summus distat ab imo
*Viscera*que assiduæ debita præbet avi.

Id. Ibis. 181.

Porrectusque novem Tityus per jugera terræ
Assiduas atro *viscere* pascit aves.

Tibul. Eleg. I. III. 75.

If we fix our attention then on these two distinguishing characters, and at the same time take into consideration the size and strength, and the consequent powers of body that separate the *Vultures* from all other groups in Ornithology, we may at once determine that the birds in which these characters are most strongly conspicuous, will form the typical group of the family. Those species therefore may be selected as forming the *Normal Group* of the *Vulturidæ*, in which the powers of the bill and legs are most apparent, the head and neck most devoid of feathers, and the organs of smell most fully developed. This group will be found chiefly to inhabit the torrid regions, and their food to be almost exclusively carrion, which they prey upon for the most part in large flocks. On the other hand, the *Aberrant Group* will comprise those birds which exhibit a comparative weakness in the bill and legs, a less extension of the organs of smell, and a smaller portion of the head and neck devoid of plumage; or, where although some degree of the size and strength of the more typical birds is preserved, the greater part of the head and neck is covered with feathers. This group may be observed to spread itself over the higher and colder latitudes more extensively than the typical *Vultures*, and to seek occasionally a living prey, which they frequently pursue either singly or by pairs.

§ *NORMAL GROUP. General conformation powerful; head and neck bare of feathers; organs of smell strongly developed.*

The *Normal group*, as it has been found to be the case in all the hitherto examined departments of Zoology, divides itself into two distinct forms, which, in addition to their differences in external character, are distinguished by their geographical dis-

Nec Tityon volucres ineunt Acherunte jacentem;
Nec, quod sub magno scrutentur pectore, &c. &c.

Lucret. de Rer. Nat. III. 997.

Et Tityos—

— lateris piger sulcator opaci

Invitus trahitur lasso de pectore Vultur.

Claudian De Rapt. Proserp. II. 338.

See also CLAUDIAN. In Ruf. II. 511. HORAT. Carm. I. iv. 77. PETRON. ARB. Fragm. p. 866. Ed. Burmanni. 1743, &c. &c.

tribution, being respectively inhabitants of the New and Old World. The first of these, or the genus

SARCORAMPHUS, Dum.,

is known by the fleshy caruncles which are appended to the cere. These appear by their connection with the *nares* to increase the delicacy of these organs, and they thus form important points of distinction in the distribution of the family. The *nares* themselves are large, oval, and longitudinal; and are situated almost at the extremity of the cere. The third quill feather is the longest. As in all the typical birds of the family, the bill and legs of this genus are robust and muscular, and the strength and size of the body indicate considerable powers. These birds belong exclusively to the New World, where three species of them have been found; the *Vultur papa* of Linnæus, commonly known as the *King of the Vultures*; the *V. gryphus* of the same author, or the *Condor* of M. de Humboldt; and the *V. Californianus** of Dr. Shaw.

* The *Vultur Californianus* was originally described by Dr. Shaw, and figured in the *Naturalist's Miscellany*, [pl. 301.] from a specimen presented to the British Museum by Mr. Menzies. He says that there are no caruncles on the bill or head. "*The head is entirely void of any carunculated appearance, but the occiput or back part is marked by a dark patch or zone which seems to rise a little above the surface.*" *Gen. Zool.* Vol. VII. p. 11. I have examined the specimen in the British Museum, which unfortunately has lost the cere, and has only the bare bone of the bill remaining. It is of course impossible from its present appearance to determine whether the bird had caruncles or not. The wings and tail are also imperfect, which indeed is generally the case among the *Vultures*, who trail these parts upon the ground and thus damage them considerably: but its general appearance is that of the true *Sarcoramphi*, and the disposition of the *nares* is the same. It is more than probable that the specimen was perfect, at least with regard to its bill, when first examined by Dr. Shaw, or he would not so positively have assured us that it was without those appendages to the head. If we allow this to be the case, we may determine that the species stands at the extreme limits of the genus *Sarcoramphus*, where it joins the true *Vultur*. M. Temminck also has figured this bird, [Pl. Col. 31.] but he has added nothing to our knowledge of it. His figure in fact is but a mere copy of Dr. Shaw's. Like the specimen in the Museum it is *without any cere* on the bill. He has however substituted for the specific name of *Californianus*, originally conferred on the bird by our countryman, a new one of his own, *Vulturinus*.

The second form of the typical group is the true

VULTUR, Auct.,

which is distinguished from *Sarcoramphus* by the absence of the fleshy caruncles on the head, and by the situation of the *nares*, which, although of the same form as in that genus are placed transversely or rather obliquely, instead of longitudinally, on the cere. The first quill feather is short, being of equal length with the sixth: and the fourth is the longest. Of this genus, which is confined to the Old World, the *V. fulvus*, Briss., and *V. cinereus*, Gmel., may be selected as types.

To these species M. Temminck has added *V. monachus*, Linn., [Pl. Col. 13 & 222.]; *V. Pondicerianus*, Lath., [Pl. Col. 2.]; *V. auricularis*, Daud., [Ois. d'Afrique pl. 9.]; *V. Indicus*, Lath., [Pl. Col. 26.]; and *V. Angolensis*, Gmel. These two latter species he intimates as being true *Vultures*, but standing at the extreme limits of the genus. I have not had an opportunity of accurately examining any of these species except the last. This evidently presents a modification of form, which may hereafter lay the foundation of a new group. Its bill is that of the genuine *Vultures*, but the back part of the head and neck is covered with feathers, the under parts only being naked. It thus indicates the immediate passage from the present group of true *Vultures* to that of *Gypætus*, upon which we are about to enter, and in which the head and neck will be found to be nearly entirely plumed.

This genus *Vultur* has again been subdivided by M. Savigny into two departments, of which the above mentioned European species are respectively the representatives. To the form which is represented by *V. fulvus*, and which is characterized by having the tongue furnished with sharp points, the *nares* simple or naked, and the tail composed of twelve feathers, he has restored the ancient name of *Gyps*: while for the second, or that which includes *V. cinereus*, and which is distinguished from the preceding by having the tongue smooth and unarmed, the *nares* partially covered with a membrane, and the tail feathers increased to the number of fourteen, he has equally revived the old denomi-

nation of *Ægyptius*. These are well distinguished groups, as indeed are all the divisions of the acute and learned naturalist who characterized them; and according as the species of the family become more accurately known, they must be adopted. But at present so much confusion exists with respect to these species, and so inaccurate is our knowledge of their minuter characters, such, for instance, as the conformation of their tongue on which M. Savigny with justice lays much stress as a ground of distinction, that it would be difficult to class any of them according to his views, beyond the two well known species which he himself examined. I refer only at present therefore to these groups as sectional subdivisions, or more minute modifications of form of the great genus *Vultur*; it being my intention solely to give the outlines of the leading forms in the family, with the view of pointing out the mode by which the sketch may be more easily filled up hereafter.

§§ ABERRANT GROUP. *General conformation weaker; head and neck less bare of feathers; organs of smell less developed.*

On leaving the birds which display the typical characters of the family, we find some of these characters partially preserved, as is usually the case, in the form which succeeds, and the transition of one form into the other thus rendered less abrupt. The marked character of size and muscular conformation which belongs to the true *Vultures* is so far retained in the group on which we now enter, or the genus

GYPÆTUS, Storr,

as almost to induce us from its great dimensions and robust appearance to assign it a place in that subdivision of the family. But the neck is entirely covered with feathers, and the head is only partially bare; while the bill is furnished with a tuft of hairs which covers the *nares*, and which may thus be considered as causing some deficiency in the acuteness of these organs. The bill itself is somewhat weaker than in the preceding group; and the *tarsi* are short and feathered, thus also indicating a partial decrease in strength. The first quill feather is not much inferior to the second and third, which are equal and the longest

of all. The number of the tail feathers is twelve. This group like the last is a native of the Old World, and is represented by the *V. barbatus* of Linnæus. M. Temminck arranges some extra-European birds in this genus, which however do not appear to possess the character of the bearded bill. These most probably will form the extreme group of this division of the family and connect it with the succeeding.

In the covering of the head and neck, the birds of this genus may be observed to bear a considerable resemblance to the *Falconidæ*,* which they also emulate in their bold and upright appearance; the *Vultures* being for the most part noted for their dull mien, and bending and ungainly postures. In habits also they approach the *Falconidæ*, preying more generally upon living animals than upon carrion, and not being gregarious like the typical *Vultures*, but feeding solitarily or by pairs. They thus form that division of the present family, which leads immediately to the conterminous family of *Falconidæ*, from which they may be said to be chiefly distinguished by their moderately curved, and comparatively speaking blunted *ungues*. This forms a marked character for separating the two groups; the *Vultures*, which feed chiefly on dead or diseased animals, and always on the spot †

* This group which seems to be the *Φων* of the ancients is generally referred to as bearing a resemblance to the *Eagles*. Its plumed head and neck, and the partial approximation in manners noticed above, must have assimilated it closely in the eye of casual observers. Ælian enumerates the *Φων* among the *Accipitrine* tribes. [Lib. XII. c. IV.]: and Pliny refers to the bird "quam *barbatam* vocant" as an "aquila," [Lib. X. c. III.] The Scholiast upon Homer makes the *Φων* nearly allied to the *Eagle*. "*Φων, εἶδος ὄρνεθ, ὁμοίον αἰτῶν*" Not. in *Odys.* III. 372. And Antoninus Liberalis, when relating the metamorphosis of Periphas into an *Eagle*, adds that his wife was changed into the *Φων* in consequence of her intreaties to become a species corresponding in habits with the former bird. *Ζεὺς δ' ἰδὼν εἰς τὰ οἶκιά τῃ Περιφαντῷ, — ἐποίησεν ὄρνιθα Αἰετὸν τῇ δὲ γυναῖκα αὐτοῦ, δειδυῖσαν καὶ αὐτὴν ὄρνιθα ποιεῖται ΣΥΝΝΟΜΟΝ Τῷ ΠΕΡΙΦΑΝΤΙ, ἐποίησε ΦΗΝΗΝ.*" *Met.* VI. p. 43. Ed. Verheyk. 1774.

† This difference extends even to the mode in which both groups convey the support of their young ones to the nest. The *Falconidæ* bear it in their claws without preying upon it themselves; the *Vulturidæ* devour it, convey it in their craw, and disgorge it in the nest for their young. See LE VAILE. *Ois. d' Afr.* tom. I. p. 29.

where they find their quarry, not needing that sharpness and curvature of the claw which is necessary to the *Falconidæ* in the seizure and transportation of their prey.

M. Savigny has conferred the name of *Phene* upon this group, with the view of reviving its ancient classical denomination. It would indeed be most desirable that every group in natural history should retain that name, as far as it can be ascertained, which it possessed in the earlier days of science, and with which most admirers of ancient literature are generally speaking familiar. But were we in the present advanced state of the science to adopt the alterations which the elegant and classical taste of M. Savigny has suggested, a complete revolution would take place in the nomenclature of Natural History. There is scarcely a group in the whole series of zoology which preserves its original classical name: and many indeed of the established names, which are derived from ancient literature, have been applied indiscriminately not merely to animals different from the species which they represented in former times, but to animals occupying a different station in nature; as for instance where the names of Birds have been bestowed on the groups of Entomology. Where a favourable opportunity occurs, as when it is necessary to subdivide an old group, the classical name may with propriety be introduced: in the subdivision of *Vultur*, for example, the term *Gyps* or *Ægyptius* would be singularly appropriate. But it would now be hazardous, indeed impracticable, to attempt any general alteration in established names, however improperly they may have been applied in the first instance. In the present case the term *Gypæetus* has the precedence over every other name bestowed by modern science on this group, having been applied to it many years before the work of M. Savigny appeared, and being in fact referred to in that work among the synonyms of the species; and as it is peculiarly applicable to the genus, by pointing out its place among the *Vultures* and at the same time its vicinity to the *Eagles*, it cannot with any propriety be rejected.

The next form that presents itself possesses somewhat of the character of the preceding group in having the neck covered with feathers. The fore part of the head however is entirely bare, and

the general conformation becomes more feeble. This group, which belongs to the Old World, forms the genus

NEOPHRON, Sav.,

and is distinguished by the comparative weakness of the bill and legs, particularly of the former, the under mandible of which curves downwards, and exhibits no traces of the strong *gonys* which adds so much to the powers of the bill of the typical *Vultures*. In these respects the bill has a striking analogy to that of the *Tachypetes* and others of the oceanick birds whose manners are raptorial. The *nares* are oval, lengthened, and longitudinal; the third quill feather is the longest; and the number of the tail feathers amounts to fourteen. The tail itself is nearly cuneiform. The *Vultur percnopterus*, Linn., known as an European bird, but still more familiar to us as an inhabitant of Egypt from the descriptions of M. Savigny and Mr. Bruce, is the type of this interesting form.

There is a greater difference between the typical species of this last genus and the present group, than between any other divisions of the family. Some species, however, which have latterly been added to *Gypæëtus*, seem to fill up the interval; being intermediate between the strength of that genus and the weaker conformation of *Neophron*. The *Falco Vulturinus*, Daud., in particular, which M. Temminck refers to *Gypuçëtus*, seems at once to unite the two groups: possessing, as far as can be judged from a figure, the plumed head and neck of the one, and the weak and lengthened bill of the other. The *tarsi* also, feathered half way down, point out the passage between the plumed and naked *tarsi* that respectively characterize these genera.

Next in affinity to *Neophron* is a group which seems to supply its place in the New Continent, the genus

CATHARTES, Ill.*

which possesses a corresponding weakness of the bill and legs, and a similar construction of the wing. But the neck is more

* This genus corresponds with the *Catharista* of M. Vieillot. I have felt some hesitation in preferring the name of M. Illiger to that of the latter natu-

bare of feathers : and the bill, although weak, is rather shorter, and approaches more closely to the form of that of *Sarcoramphus*, the under mandible being straight, and the *gonyes* being faintly apparent. The tail, consisting of 12 feathers, is even. The cere of these birds is much advanced in front, and the *nares* are situated at the antérieur part of it. These are oval, but extremely elongated, and placed longitudinally. The *Vultur aura*, Linn., the *Turkey Buzzard* of America, and the *C. urubu*, Vieill., [*V. atratus*, Wils.] nearly allied to it, but latterly separated by M. Vieillot, and the American ornithologists, by apparently good specific characters, are the representatives of the genus. This group completes the circle in which the *Vulturidæ* are included by leading round to *Sarcoramphus*, the other American form, with which we commenced our examination of the family. With that genus *Cathartes* possesses a near alliance with regard to its general characters, the fleshy caruncles on the bill of *Sarcoramphus* being excepted ; but it differs materially in the weakness of all its organs, which bear no comparison with the strength and powerful construction exhibited in the typical *Vultures*.

Such are the leading peculiarities of form in the family of *Vulturidæ*, and such the mode in which they succeed each other, and by which they accord more or less with the typical character. New species may perhaps come in which may not agree in every particular with any of the above forms, and a more accurate

ralist, who certainly was the first to characterize the group as separate from *Sarcoramphus*. But although M. Illiger included the *Vultur papa*, the type of *Sarcoramphus*, in his *Cathartes*, and thus rendered his genus too extensive, yet the characters he gave it are still sufficiently applicable to the species which remain to serve to distinguish them : and his name being prior, and certainly better known from having been earlier adopted, is perhaps on the whole to be preferred. I must here observe that the *Cathartes* of M. Temminck [Man. p. xlviii and p. 7] is very different from that of M. Illiger. Besides the species included in the genus of that naturalist, M. Temminck introduces the *Vultur percnopterus* of Linnæus, by which means he brings together the three genera of his predecessors *Sarcoramphus*, Dum., *Cathartes*, Ill., [*Catharista*, Vieill.] and *Neophron*, Sav., without any reference to them. I scarcely know two forms belonging to the same family more decidedly distinct from each other, than those of *Sarcoramphus* and *Neophron* : as may be seen from comparing their respective characters in the above sketch.

knowledge of the species already described may bring to light properties not hitherto noticed among them. But these, we may almost venture to assert from our general knowledge of the typical character of these birds, and of the mode in which it varies, founded on our observations of their habits and station in nature, will be found either to be partial modifications of the prominent forms, as in the case of M. Savigny's genera *Gyps* and *Ægyptius*, which represent only divisions of the more extensive genus *Vultur*, or to exhibit a greater or less developement of the leading peculiarities of these forms. In some of the more numerous groups of Ornithology, such as the *Muscicapidæ*, *Fringillidæ*, &c., where a multiplicity of species and of forms tends to perplex the naturalist in his investigation of affinities, it may be difficult to decide the mode in which nature arranges them without an extensive knowledge of species. Here of course the paucity of materials open to the student in this country, so often and so justly the subject of complaint, gives a decided disadvantage to British naturalists, in comparison with those of the Continent, in their speculations on the leading properties of such groups. But in a limited family like that of the *Vultures*, where their purposes in nature are so conspicuous, and the characters depending on these purposes so prominent and strongly marked, there is comparatively little difficulty in deciding what are the leading peculiarities of form among them, although we may be denied the power of entering into their details.

Although I confine myself at present to the typical species of the preceding forms, I cannot pass over without notice two species described as belonging to this family, which seem to accord with none of the groups which I have particularized. I allude to the *New Holland Vulture* of Dr. Latham, which has been figured in the last edition of the "General Synopsis,"* from a specimen originally in the possession of General Davies; and the *V. audax* of the same authour, said to be from the same country. Hitherto no *Vulture* has been recorded as a native of New Holland with the exception of these reputed species; neither has the genus been found in the neighbouring islands of the Indian ocean,

* Vol. I. p. 32. sp. 27. pl. VI.

as far as to the Island of Java. Their place in New Holland seems to be supplied, as far as we can judge from the facts as yet before us, by the naked-cheeked *Falconidæ*, which form the genus *Polyborus* of M. Vieillot. It becomes therefore an interesting question whether the species described by Dr. Latham belong to the circle of *Vultures* or not. From the figure that is given of the former of these birds some doubts arise on this point: as the bill is straight and slender, and the legs and toes long, and the nails, particularly that of the *hallux*, sharp and perfectly straight. The figure has in fact more the appearance of a *Wading Bird* than of a *Bird of Prey*. We have no figure of the *V. audax*. From the known accuracy of Dr. Latham however, who described both birds, we may determine that they appertain, or at least approach, to the raptorial group in which he has placed them. Under these circumstances these birds become doubly interesting. We want a form to complete the series of affinity among the *Raptores*: these species may probably belong to the group which furnishes it; and thus we may have our chasm filled up by the productions of that extraordinary portion of the globe which has already supplied so many of our deficiencies.

The following tabular view of the characters of this family and of the leading forms belonging to it will enable the reader to distinguish the peculiarities of these forms as they accord with, or deviate from the typical family character, as well as the series of affinity in which they succeed each other. I introduce those species only which are the types of each form.

FAM. VULTURIDÆ.

Caput, collumque plus minusve nuda. *Rostrum* præcipuè forte, ad apicem aduncum, basi latè cerigerum. *Nares* laterales, in ceromate positæ, ovales, interdum elongatæ, plerumque apertæ. *Tarsi* reticulati. *Digiti* externi membrano connexi. *Ungues* validi, subacuti, subincurvi, vix retractiles.

DIVISIO TYPICA.

Caput collumque nuda. Rostrum pedesque fortes.

Rostrum carunculatum. Nares longitudinales. Remex 3^a longissima.

SARCORAMPHUS.—Dum.

Habitat in Mundo Novo.

Vultur papa. *Linn.* 1. p. 122. 3. *Edw.* t. 2. *Alb.* 11. t. 4. *Pl. Enl.* 428. *Daud.* 11. pl. 1X. *Briss.* 1. t. 36. *Gal. des Ois.* pl. III.

Rostrum haud carunculatum. Nares transversæ. Remex 1^a brevis, 6^a æqualis; 4^a longissima.

VULTUR.—Auct.

Habitat in Mundo Vetere.

* *Lingua aculeatâ, naribus apertis; rectricibus* 14. *Gyps. Sav.*
Vultur fulvus. *Briss.* 1. p. 462. 7. *Pl. Enl.* 426. *Alb.* 111. t. 1.
** *Lingua muticâ, naribus membrano partim tectis; rectricibus* 12. *Egyptius. Sav.*
Vultur cinereus. *Gmel.* 1. p. 247. 6. *Pl. Enl.* 425. *Gal. des Ois.* pl. I.

DIVISIO ABERRANS.

Caput collumque minus nuda. Rostrum pedesque debiliores.

Caput plurimum, collumque totum plumosa. Rostrum subcrassum, barbatum. Nares barbâ setosâ opertæ. Remiges 2^a et 3^a æquales, longissimæ. Tarsi breves, plumosi. Rectrices 12.

GYPAËTOS.—Storr.

Habitat in Mundo Vetere.

Vultur barbatus. *Linn.* 1. p. 123. 6. *Edw.* t. 106. *Daud.* 11. t. X. *Shaw. Gen. Zool.* Vol. VII. pl. 5. & 6. *Gal. des Ois.* pl. VIII.

Caput antierius nudum. Collum plumosum. Rostrum pergracile; mandibulâ inferiore deorsum curvatâ; gonyde nullo. Nares longitudinales. Remex 3^a longissima. Rectrices 14.

NEOPHRON.—Sav.

Habitat in Mundo Vetere.

Vultur percnopterus. *Linn.* 1. p. 123. 7. *Pl. Enl.* 429. *juv.* 427. *Gal. des Ois.* pl. II.

Caput totum collumque partim nuda. Rostrum gracile. Nares perelongatæ, longitudinales. Remex 3^a longissima. Rectrices 12.

CATHARTES.—Ill.

Habitat in Mundo Novo.

Vultur aura. *Linn.* 1. p. 122. 2. *Pl. Enl.* 187. *Ois. d'Am. Sept.* pl. 2. bis. *Wils. Am. Orn.* IX. pl. 75. f. 1. *Gal. des Ois.* pl. IV.

ON A NEW GENUS OF FALCONIDÆ.

In one of the preceding numbers of this Journal,* where I attempted to give a sketch of the groups of the *Falconidæ*, I expressed my doubts whether two species belonging to the subfamily of the *Kites*, and nearly related to *Elanus*, Sav., the *Falco furcatus* of Linnæus, and the *Falco Riocourii* of M. Vieillot, exactly corresponded with the characters of that genus. At the time when I drew up the sketch, I had not the means of making that accurate examination of these species which was necessary for determining the point. The two birds however have since come within my reach. Dr. Such, whose extensive researches in Brazil have enriched science with so many important acquisitions, has kindly presented me with a beautiful specimen of the *F. furcatus*, which he brought from that country : and I am indebted to Mr. Leadbeater of Brewer Street, the value of whose collections in Ornithology is equalled only by his liberality in opening them to science, for an opportunity of comparing a fine specimen of *F. Riocourii* with the conterminous species. From the examination which I have thus been enabled to make of these birds, it appears to me that they do not sufficiently accord with *Elanus* to be admitted into the same genus. They have not the cylindrical *ungues* of that group ; a character, which serves so much to distinguish it among the birds of the family, and which appears to form a very decided ground for separation from the rarity of its occurrence, two groups only, *Pandion* and *Elanus*, having been as yet observed to possess it. The tail also of the two birds in question is considerably forked, while that of *Elanus* exhibits but an approximation to the same form, or rather the first deviation from the even tail of the preceding subfamily. Thus compared with *Elanus* they seem to hold a distinct and a higher station in the present subfamily. And while *Elanus* seems to hold its station at the first entrance into the group, they most probably will be found to form the typical species of it, in consequence of the extreme developement of the forked tail ; which, it may be remembered adds strikingly to the powers of flight in the *Kites*,

* Vol. I. p. 333.

supporting their evolutions, and directing their progress, as they soar or sail through the air. From these considerations I shall venture to characterize the group as follows under the generic name of

NAUCLERUS.

Rostrum subbreve, debile, compressum; *naribus* subovalibus, in ceromate, setis ad basin instructo, obliqué positis.

Alæ longæ; *remige* 2^{dâ} aut 3^{tiâ} longissimâ.

Cauda longa, maximé furcata.

Pedes breves, debiles; *tarsis* reticulatis; *acrotarsiis* infra genu usque ad medium plumosis; *unguibus* haud cylindricis.

Corpus gracile, concinnum.

It will of course be immediately evident that the nearest affinity of this genus in the *Milvine* subfamily is to *Elanus*; with which it has the characters of the bill and legs in common, the cylindrical *ungues* of the latter being excepted. There is also a general similarity in the colours of the two genera, and in the disposition of them. *Nauclerus* is distinguished from the true *Milvus* by the greater development of the character of the forked tail; by the relative proportions of the wing feathers, the fourth being the longest in *Milvus*; and by the reticulation of the *acrotarsia*, those of *Milvus* being covered with even scales or scutellated. Although the species known at present of this new group have been already well described, the following specific characters taken immediately from two fine and apparently adult specimens now before me may not be unacceptable.

* *Remige* 2^{dâ} longissima.

RIOCOURII. *N. albus*, capite colloque supernè, dorso alis rectricibusque griseis, lineâ ante poneque oculos maculâque alarum nigris.

Rostrum nigrum; *cera pedesque* flavi. *Remiges superiores* griseæ, internæ ad basin albæ, tribus exterioribus exceptis, apice albo-marginatæ; secundariæ quatuor internæ nigræ, maculam longitudinalem nigram formantes: inferiores albæ apice griseæ; *ptilis* inferioribus partim nigris, maculam longitudinalem nigram

formantibus. *Rectrices* griseæ, internæ ad basin albæ; inferiores ad basin albæ apice grisescentes. Longitudo corporis, 1 pes, 2 $\frac{1}{2}$ unc.; alæ a carpo ad remigem 2dam, 9 $\frac{2}{3}$; caudæ, 9; mandibulæ superioris ad frontem, $\frac{6}{10}$, ad rictum, $\frac{4}{5}$; inferioris $\frac{6}{10}$; tarsi, 1 $\frac{2}{3}$.

Habitat in Africâ.

** *Remige 3tiâ longissimâ.*

FURCATUS. *N. albus, dorso medio, alis, rectricibusque nigris, purpureo nitentibus.*

Rostrum nigrum: cæra pedesque flavi. *Ptila* purpureo-atra; tectrices inferiores albæ: remiges secundariæ, pteromata, scapularesque albo-variegatæ. Longitudo corporis, 1 pes, 10 unc.; alæ a carpo ad remigem 3tiâ, 1 pes, 4 unc.; caudæ, 1 pes, 1 unc.; mandibulæ superioris, ad frontem, 1 $\frac{1}{2}$, ad rictum, 1 $\frac{1}{4}$; tarsi, 1 $\frac{1}{2}$.

Habitat in Mundo Novo.

There is a material difference in the construction of the wing in these two birds. In the latter or the American species the third quill feather is the longest, the first and second are marked by an abrupt emargination in the inner web, and the second third and fourth by a gradual decrease in breadth of the outer web towards the apex. On the other hand the African species has the second quill feather the longest, with a slight emargination only towards the apex of the first and second feathers, while the outer webs of all are nearly even throughout. In consequence of these characters *N. Riocourii* comes most nearly to the group of *Elanus*, while *N. furcatus* shows an approximation to the true *Milvus*.

ON A NEW GENUS OF PSITTACIDÆ.

Among the primary groups or subfamilies into which the Parrots appear to be divided, two of the most conspicuous, as I have elsewhere observed, are the birds which we familiarly call *Macaws*, and those commonly known under the name of *long-*

tailed Parrakeets. The former, or the genus *Macrocerus*, Vieill. inhabitants exclusively of the New World, are distinguished by the nakedness of the cheeks, and the extreme strength of the bill, the under mandible of which is short, bent inwards, and deeply emarginated. The latter, or the section *Conurus* of M. Kuhl, dispersed in various modifications of form over all the warmer parts of the globe, come next in affinity to the preceding group by the length and graduated structure of the tail, but are separated from it by the cheeks being feathered. The bills also of this subfamily exhibit a regular gradation of form from the strong bill and short under mandibles of the *Maccaws*, to the comparatively feebler bill and more elongated under mandibles of the succeeding subdivisions of the family.

Between the two subfamilies thus separated from each other, a beautiful connection is preserved by means of a group which comprises the extreme species, or the earliest that present themselves to us, of the second of these subdivisions. These birds, although their cheeks are covered with feathers and they are thus brought within the circle of the *Parrakeets*, have yet the bill of the *Maccaws*; and by a greater or less nakedness of the orbits round the eyes they still further assert their affinity to them. From their osculant situation between the two groups, thus strikingly apparent, the species that exhibit these characters have received the familiar name of *Parrakeet-Maccaws* in our language, and of *Perruche-Aras* among the French Ornithologists. Like the true *Maccaws* they are exclusively natives of the New World.* Two species, lately added to our collections in this country, and which appear to me to be new to science, afford me an opportunity of characterizing this interesting group, which from its intermediate station between the two subfamilies, and with a reference to the trivial name already bestowed upon it, I shall denominate

PSITTACARA.

Caput plumosum, periopthalmiis nudis.

Rostrum crassum, subbreve; mandibulâ superiore apice sub-

* An Eastern form however nearly allied to both these groups has lately come to this country, which Dr. Horsfield and myself will shortly have an opportunity of characterizing.

compressâ, inferiore brevissimâ introrsum inclinante, profundé emarginatâ.

Alæ mediocres; *remige* 1^{mâ} et 4^{tâ} æqualibus, 3^{tiâ} paulo longiore, 2^{dâ} longissimâ: primæ pogonio interno leviter prope medium emarginato; secundæ ad quintam inclusam pogoniis externis in medio gradatim latioribus.

Cauda longa, gradata.

Pedes subfortes, *tarsis* brevibus.

The *Psittacus Guianensis* of Linnæus, the *Perruche-Ara Pavouane* of M. Le Vaillant [Pl. 14. 15.] may be selected as the type of this genus. To this may be added the following species, which accurately accord with the general characters of the genus, but in which the naked space round the eye is more contracted; *P. squamosus*, Lath., [Nat. Misc. t. 1061]; *P. versicolor*, Lath., [Pl. Enl. 144. Le Vaill. pl. 16]; *P. vittatus*, Shaw, [Le Vaill. pl. 17]; together with the *P. auricapillus* and *P. leucotis* of M. Lichtenstein. I have lately received the following birds from Brazil, which are also referable to the group, although, from the difference in the extent of the naked space round the eye of each, they appear to occupy different stations in it.

FRONTATUS. *Ps. viridis, capitis fronte cæruleo, humeris coccineis; spatio inter oculos rostrumque nudo.*

Alæ caudaque supra virides, subtus flavescenti-fuscæ. *Ptila* inferiora coccinea. Longitudo corporis, $12\frac{1}{2}$ unc.; *alæ* a carpo ad remigem 2^{dâ}m, $6\frac{8}{10}$; *caudæ*, $6\frac{8}{10}$; *mandibulæ* superioris ad frontem, $1\frac{2}{10}$, ad rictum, $\frac{9}{10}$; inferioris, $\frac{6}{10}$; *tarsi*, $\frac{7}{10}$: altitudo rostri, $1\frac{1}{10}$.

As in taking a comprehensive view of the two great subdivisions now before us of this family, the present genus is seen to form the bond of connection between them; in like manner, when we descend to particulars, the species now described will be found to be the immediate link between the extreme species of each. On looking to the character of the naked cheeks of the *Maccaws*, we perceive that in the typical species of that subfamily, the nakedness extends all round the eyes and over the cheeks, while in some

of the extreme species, such as *Ps. Illigeri*, Temm. and Kuhl, and *Ps. makawanna*, Gmel., a smaller portion of the cheeks is bare. On the other hand, in the typical species of the genus *Psittacara*, the orbits of the eyes only are naked. With reference to the same character the species now under consideration is precisely intermediate between both. While the orbits of the eyes are naked, but the cheeks clothed, as in *Psittacara*, the space between the eyes and bill is bare, by which means it nearly meets the above mentioned extreme species of the *Maccaws*. It is one of those species in fact, which may, with equal justice, be referred to either of the neighbouring groups which it connects, according to the will of the naturalist; and it is interesting as it exemplifies the arbitrary character of the divisions, which we are forced to institute for the sake of convenience, while nature herself exhibits no break. The exact concordance of the species with the present group in the structure of the wing, in which respect it slightly differs from the *Maccaws*, induces me to prefer for it the station which I have now assigned it.

LICHTENSTEINII. *Ps. viridis*, capite nigrescenti-brunneo, posticè aureo-variegato; fasciâ frontali angustâ, regione paroticâ, abdomine medio, uropygio, caudâque infra castaneo-purpureis; torque nuchali pectoreque cæruleis; humeris coccineis.

Capitis plumæ nigrescenti-brunnæ, posticæ apice aureo-marginatæ, maculam auream utrinque pone aures formantes. *Remiges*, primariæ supra cæruleæ, primâ quæ est cæruleo-atra exceptâ, pogniis internis ad basin flavo-fuscis, ad apicem atris; secundariæ virides, internæ ad basin flavo-fuscæ; omnes inferiores fuscæ, ad basin internæ flavo-fusco marginatæ. *Ptila* inferiora viridia; *ptermata* inferiora flavo-fusca. *Longitudo corporis*, $10\frac{1}{2}$; *alæ* a carpo ad remigem 2^{dam} , $6\frac{2}{5}$; *caudæ*, $5\frac{4}{5}$; *mandibulæ* superioris ad frontem, $\frac{1}{2}$, ad rictum, $\frac{4}{5}$; inferioris, $\frac{1}{5}$; *tarsi*, $\frac{1}{2}$; *altitudo rostri*, $\frac{1}{5}$.

In honorem Zoologiæ Professoris Berolinensis celeberrimi, Ornithologiæ peritissimi, hæc avis nominatur.

ON THE ARRANGEMENT OF THE GENERA OF BIRDS.

HAVING been frequently requested by several of my Ornithological friends to furnish them with a list of the genera of Birds as they arrange themselves under their Orders and Families, in consonance with the views exhibited in a paper "On the Affinities of Birds," lately inserted in the *Linnean Transactions*, I am induced to draw out the following tabular sketch of the genera which have hitherto been published in Ornithology. It was the object of that Paper to give only the general view of the various groups of Birds as they displayed their affinities and analogies among themselves, without entering into the particulars of the minuter subdivisions. Many established genera were of consequence overlooked in it, as not bearing upon the general subject, which will be enumerated in the following Synopsis. I am not in general friendly to sketches of the present description, in which the characters and affinities of groups are not explained and illustrated. Such skeletons of systems always begin where they should end; in taking for granted, instead of attempting to prove, the propriety of the views which they profess to follow:—they assert, in fact, where they should demonstrate. The following sketch, however, may be considered as in some measure supplementary to the general principles laid down in the Paper to which I have alluded, and must be viewed only with a reference to it. As such it may be useful, meagre as it is, in supplying the place, for a time, of a more detailed and perfect exposition of the subject. And I take this opportunity of adding, that it exhibits the foundation of an elementary plan, into which it is my intention to enter more fully at an early period, as introductory to the study of Ornithology.

I have added the characters of a few generick groups, which serve in some instances to fill up the series of affinity in the families. The experienced Ornithologist will at once perceive how many more are still necessary for that purpose.

Synopsis AVIUM in Ordines, Familias, et Genera* secundum affinitates dispositarum.

ORDO I. RAPTORES. *Ill.* [Accipitres. *Linn.*]

I. FAM. — ?

Gypogeranus. *Ill.* [Serpentarius. *Cuv.* Ophiotheres. *Vieill.*]

II. FAM. VULTURIDÆ. [Gen. *Vultur.* *Linn.*]

*

Cathartes. *Ill.* [Catharista. *Vieill.*]

**

Sarcoramphus. *Dum.* [Cathartis pars. *Ill.* Gypagus. *Vieill.*]

Gyps. *Sav.*—*Vultur.* *Auct.* [*Ægyptius.* *Sav.*]

Gypaëtus. *Storr.* [Phene. *Sav.*]

Neophron. *Sav.* [Cathartis pars. *Temm.*]

III. FAM. FALCONIDÆ. *Leach.* [Gen. *Falco.* *Linn.*]

* Subfam. Aquilina.

Ibycter. *Vieill.*—Daptius. *Vieill.*—Polyborus. *Vieill.*—*Pandion.* *Sav.*—*Haliaëtus.* *Sav.*—*Aquila.* *Auct.*—*Harpypia.* *Cuv.*—*Physeta.* *Vieill.*—*Morphnus.* *Cuv.* [*Spi-zaëtus.* *Vieill.*]—*Cymindis.* *Cuv.*—*Asturina.* *Vieill.*

** Subfam. Accipitrina.

Dædalion. *Sav.*—*Astur.* *Auct.* [*Sparvius.* *Vieill.*]—*Accipiter.* *Auct.*—*Harpagus.*—*Gampsonyx.*

*** Subfam. Falconina.

Hierax.—*Falco.* *Auct.*

* The British genera are distinguished by *Italicks*. Marks of doubt are attached to some genera, with whose situation I am not perfectly satisfied, either from not having had an opportunity of examining the type of the genus, or from our ignorance of the habits or of the internal construction of the birds referred to it. In most instances I shall refer to the cause of my doubts as the genera occur.

**** Subfam. Buteonina.

Ictinia. *Vieill.*—*Circus. Auct.*—*Pernis. Cuv.*—*Buteo. Auct.*

***** Subfam. Milvina.

Elanus. *Sav.*—*Nauclerus.*—*Milvus. Auct.*

IV. FAM. STRIGIDÆ. *Leach.* [Gen. *Strix.* Linn.]

* Subfam. Noctuína.

Surnia. *Dum.*—*Noctua. Sav.*

** Subfam. Bubonina.

Scops. Sav.—*Bubo. Cuv.*

*** Subfam. Asionina.

Asio. Antiq. [Otus. *Cuv.*]

**** Subfam. Strigina.

Ulula. Cuv.—*Strix. Auct.*

***** Subfam. Syrniana.

Syrnium. Sav.

V. FAM. — ?

ORDO II. INSESSORES. [Picæ.—Passeres. Linn.]

TRIBUS. I. FISSIROSTRES. *Cuv.*

I. FAM. MEROPIDÆ. [Gen. *Merops.* Linn.]

Merops. Linn. [Apiaster. *Briss.*]

II. FAM. HIRUNDINIDÆ. [Gen. *Hirundo.* Linn.]

Cypselus. Ill. [Apus. *Cuv.* Micropus. *Meyer.*]—*Hirundo. Auct.*

III. FAM. CAPRIMULGIDÆ. [Gen. *Caprimulgus.* Linn.]

Caprimulgus. Auct.—*Podargus. Cuv.*—*Ægotheles.**—*Steatornis.*—*Nyctibius. Vieill.*

IV. FAM. TODIDÆ. [Gen. *Todus.* Linn.]

Eurylaimus. Horsf.—*Eurystomus. Vieill.* [Colaris. *Cuv.*]—*Todus. Auct.*

* This is a New Holland genus, which has been characterized by Dr. Horsfield and myself, in a paper lately read before the Linnean Society on the Australian Birds in the Society's Collection.

V. FAM. HALCYONIDÆ. [Gen. *Alcedo*. Linn.]

Alcedo. Linn. [Ispida. *Briss.*]—Halcyon. *Swains.*—Dacelo. *Leach.*—Tanyptera.—Galbula. *Briss.*—Capito. *Vieill.*?—Monasa. *Vieill.*?

TRIBUS. II. DENTIROSTRES. *Cuv.*I. FAM. MUSCIPIDÆ.* [Gen. *Muscicapa*. Linn.]

Platyrhynchus. *Desm.*—*Muscicapa*. *Auct.*—*Muscipeta*. *Cuv.*—*Onychorhynchus*. *Fisch.*—*Vireo*. *Vieill.*?—*Icteria*. *Vieill.*?

II. FAM. LANIADÆ. [Gen. *Lanius*. Linn.]

* Subfam. Tyrannina. *Swains.*

Tyrannus. *Cuv.*—Tityra.† *Vieill.* [*Psaris*. *Cuv.*]—Gubernetes. *Such.*

** Subfam. Dicrurina. *Swains.*

Artamus. *Vieill.* [*Ocypterus*. *Cuv.*]—*Dicrurus*. *Vieill.* [*Edolius*. *Cuv.*]—*Trichophorus*. *Temm.*?—*Irena*. *Horsf.*

* Little has been done to subdivide and put in order this extensive family. The genera enumerated above, include but a small portion of the forms that may be distinguished in it. We have at least four very distinct New Holland groups now about to be characterized; and different modifications of form are equally apparent among the groups of America and the Old World. I am not certain that the genera of M. Vieillot, marked above with a note of doubt, are referable to this family; not having seen the species which he gives as types.

† I find much difficulty in determining the priority of the modern generic names among the Continental Ornithologists. If we were to judge only by the standard works of the chief systematic writers, such as the "Prodromus" of M. Illiger, the "Analyse" of M. Vieillot, the "Regne Animal" of M. Cuvier, and the "Manuel" of M. Temminck, the task would be easy. These works were respectively published in the years 1811—1816—1817—1820; and the priority of each name might be determined accordingly. But many of the genera of these naturalists have been described, as I understand, in works of less publicity, and in periodical journals, which are not within the reach of the British student; most of our public Libraries being lamentably deficient in books of Natural History, and particularly in the recent continental publications. Not having it in my power to determine the exact priority of name in every instance, I date each name as it appeared in the above-mentioned standard works.

*** Subfam. Laniina. Swains.

Sparactes. Ill.—*Lanius*. Auct.—*Falcunculus*. Vieill.—*Cyclarhis*. Swains.—*Lanio*. Vieill.?

**** Subfam. Thamnophilina. Swains.

Vanga. Cuv.—*Thamnophilus*. Vieill.—*Malaconotus*. Swains.—*Formicivora*. Swains.—*Drymophila*. Swains.—*Laniarius*. Vieill.—*Prionops*. Vieill.

***** Subfam. Campephagina. Swains.

Graucalus. Cuv.—*Campephaga*. Vieill. [*Ceblepyris*. Cuv.]

III. FAM. MERULIDÆ. [Gen. *Turdus*. *Orioli* pars. Linn.]

* Subfam. Myiotherina. Swains.

Urotomus. Swains.—*Myiothera*. Ill. [*Myrmothera*. Vieill.]—*Pitta*. Vieill.—*Grallaria*. Vieill.—*Conopophaga*. Vieill.—*Cinclus*. Bechst. ? [*Hydrobata*. Vieill.]—*Chamæza*. *

** Subfam. Merulina.

Merula. Ray.—*Sphecotheres*. Vieill.?

*** Subfam. Oriolina.

Oriolus. Auct.

**** Cossyphina.

Cossypha.†—*Timalia*. Horsf.?

* CHAMÆZA.

Rostrum subbreve, subforte, culmine leviter arcuato; *naribus* basalibus, oblongo-ovalibus, longitudinalibus, plumis parvulis obtectis.

Alæ brevissimæ, rotundatæ; *remige* 1mâ brevi, 2dâ et 7mâ, 3tâ et 6tâ æqualibus, 4tâ et 5tâ ferè æqualibus, longissimis; *pogoniis* utrinque ferè integris.

Pedes subgraciles; *tarsis* elongatis; *acrotarsiis* scutellatis, in scuta novem divis; *paratarsiis* in scutula plurima divis; *digitis* subelongatis, gracilibus, duobus extimis ad basin connexis, *unguibus* gracilibus, compressis; *halluce* subelongato, subforti, *ungue* subelongato, arcuato, maximè compresso.

Cauda brevis, rotundata,

Obs. Genus subfamilias *Myiotherinam*, Swains., et *Merulinam* eximiè connectens.

MERULOIDES. *C. supra brunnea, subtus rufescenti-albida, nigro longitudinaliter maculata; gula albâ; crisso, rectricumque apice rufescentibus.*

Habitat in Brasiliâ.

† I take this opportunity of characterizing one of the many forms that enter

Petrocincla.*

IV. FAM. SYLVIADÆ. [Gen. *Motacilla*. Linn.]

* — ?

Hylophilus. Temm. — *Iora*. Horsf. — *Accentor*. Bechst. —
Prunella. Gessn.?

** — ?

Brachypteryx. Horsf. — *Curruca*. Bechst. — *Ficedula*. Bechst.
 — *Ægithina*. Vieill.?

*** Subfam. *Sylviana*.

Sylvia. Auct. — *Melizophilus*. Leach. — *Synallaxis*. Vieill. —
Malurus. Vieill. — *Troglodytes*. Cuv. — *Regulus*. Cuv. —
Tyrannulus. Vieill.

**** Subfam. *Motacillina*.

into the present subdivision of the family, for the purpose of pointing out the mode by which the *Thrushes* gradually pass into the *Warblers*.

COSSYPHA.

Rostrum mediocre, subgracile, culmine leviter arcuato; *naribus* basalibus, ovalibus, longitudinalibus.

Alæ mediocres, rotundatæ: remige 1mā brevissimā, 5tā longissimā, 4tā 3tia et 2dā paulatim brevioribus; 4tæ 5tæ et 6tæ pogoniis externis leviter prope medium emarginatis.

Pedes subgraciles: *tarsis* scutellatis, *paratarsiis* integris.

Cauda mediocris, rotundata.

Typus genericus. *Turdus vociferans*. Swains.

* This genus exhibits a form which seems to connect the preceding subfamily of *Cossyphina* with that of *Myiotherina*. Swains. It is characterized as follows.

PETROCINCLA.

Rostrum subforte, rectum, culmine apice arcuato: *naribus* basalibus, rotundis, setis partim tectis.

Alæ mediocres: remige 1mā brevissimā, ferè spuriā; 3tia longissimā, 2dā paulo brevior.

Pedes mediocres, subfortes; *acroterarsiis* *paratarstiis*que integris.

Cauda brevis, æqualis.

Typus genericus. *Turdus saxatilis*. Linn.

Motacilla. Auct.—*Budytes. Cuv.*—*Enicurus. Temm.*—*Anthus. Bechst.*—*Corydalla.**—*Megalurus. Horaf.*

***** Subfam. Saxicolina.

Saxicola. Bechst. [*Cenanthe. Vieill.*]

V. FAM. PIPRIDÆ. [Gen. *Parus. Pipra. Ampelis. Linn.*]
Ægithalus.†—*Parus. Linn.*—*Megistina. Vieill.*—*Pardalotus. Vieill.*—*Pipra. Linn.* [*Manacus. Briss.*]—*Rupicola. Briss.*—*Calyptomena.‡ Raffles.*—*Phibalura. Vieill.*—*Bombycilla. Briss.*—*Ampelis. Auct.* [*Cotinga. Briss. Tersa. Vieill.¶*]—*Procnias. Hoffm.*—*Casmarhynchus.*

* CORYDALLA.

Rostrum subelongatum, subforte.

Alæ caudaque ut in genere *Antho.*

Pedes subgraciles; *tarsis* elevatis, *hallucis ungue* elongato, recto.

Typus genericus. *Anthus Richardi. Vieill.*

† ÆGITHALUS.

Rostrum subelongatum, tenue, rectum, acutum, conicum, basi subtrigonum, culmine inter plumas capitis retrorsum extendente; *naribus* setis opertis.

Alæ mediocres, rotundatæ: *remige* 1mâ brevissimâ, ferè spuriâ, 2dâ et 7mâ æqualibus, 3tiâ 4tâ et 5tâ ferè æqualibus longissimis, 6tâ paulo breviorè; 3tiâ ad 5tam inclusam pogoniis externis prope medium leviter emarginatis.

Pedes mediocres; *acrotarsiis* scutellatis, *paratarsiis* integris; *digitis* liberis, *halluce* subforti, *ungue* longo forti.

Cauda mediocris, subfurcata.

Typus genericus. *Parus pendulinus. Linn.*

‡ I have some doubts whether this genus is more nearly allied to the *Pipridæ* or *Todidæ*, in either of which families it may be placed according to its external characters. Its vegetable food [see *Linn. Trans.* vol. XIII. p. 296] however seems to place it as above with the *Berry-eaters*. The juxtaposition of these two families renders it immaterial to which of them it may eventually be referred.

¶ I cannot exactly say whether I have placed M. Vieillot's genus *Tersa* in its right place as a synonym to the *Ampelis. Auct.* The "*Tersine*" of M. Buffon, to which M. Vieillot refers as the type of the genus, is supposed to be the female of another species, which comes into the true *Ampelis*. Judging from the characters he has given, I rather incline to think his *Ampelis* corresponds with M. Temminck's *Casmarhynchus*, and his *Tersa* with the true *Ampelis* as stated above.

Temm. [*Ampelis. Vieill.*]—*Querula. Vieill. ?*—*Coracina. Vieill. ?* [*Cephalopterus. Geoff.*]—*Pachycephala. Scains.*

TRIBUS III. CONIROSTRES. *Cuv.*

I. FAM. FRINGILLIDÆ. [Gen. *Fringilla. Alauda. Emberiza. Tanagra. Linn.*]

* Subfam. *Tanagrina ?*

Euphonia. Vieill.—*Nemosia. Vieill.*—*Tachyphonus. Vieill.*—*Saltator. Vieill.*—*Tanagra. Auct.*—*Pyranga. Vieill.*—*Ramphopsis. Vieill.*—*Arremon. Vieill.*—*Dulus. Vieill. ?*—*Pipilo. Vieill.*

** Subfam. *Alaudina.*

Emberiza. Linn.—*Passerina. Vieill.*—*Alauda. Auct.*—*Mirafr. Horsf.*

*** Subfam. *Carduelina.*

Carduelis. Briss.—*Ploceus. Cuv.* [*Agelaii pars. Vieill.*]

**** Subfam. *Passerina.*

Fringilla. Auct.—*Passer. Auct.* [*Pyrgita. Cuv.*]

***** Subfam. *Pyrrhulina ?*

Linaria. Bechst.—*Vidua. Cuv.*—*Pyrrhula. Briss. ?*

II. FAM. STURNIDÆ. [Gen. *Sturnus. Orioli pars. Buphaga. Linn.*]

* Subfam. *Icterina.*

Xanthornus. Cuv. [*Yphantes. Vieill.*]—*Icterus. Cuv.* [*Pendulinus. Vieill.*]—*Sycobius. Vieill. ?*—*Quiscalus. Vieill.*—*Cassicus. Daud.*—*Leistes. [Agelaii pars. Vieill.]*

** Subfam. *Sturnina.*

Sturnella. Vieill.—*Sturnus. Linn.*—*Amblyramphus. Leach.*—*Dilophus. Vieill. ?**

*** — ?

Lamprotonis. Temm.—*Acridotheres. Vieill.* [*Gracula. Cuv.*]

* I know not whether the *Sturnus gallinaceus. Lath.*, [*Gracula carunculata, Gmel.*] which forms the type of M. Vieillot's *Dilophus*, comes within the present subfamily or not, having never seen the bird.

**** — ?

Pastor. Temm. [*Psaroidos*. Vieill.]—*Grallina*. Vieill.?

***** — ?

Buphaga. Linn.

III. FAM. CORVIDÆ. Leach. [Gen. *Corvus*. *Coracias*. *Gracula*. *Paradisæa*. Linn.]

* — ?

Cracticus. Vieill. [*Barita*. Cuv.]—*Nucifraga*. Briss.

** Subfam. *Corvina*.

Pica. Briss.—*Garrulus*. Briss.—*Corvus*. Auct.

*** Subfam. *Coraciana*.

Coracias. Linn. [*Galgulus*. Briss.]—*Gracula*. Auct. [*Eulabes*. Cuv.]—*Ptilonorhynchus*. Kuhl.—*Glaucopis*. Forst. [*Callæas*. Lath.]—*Crypsirina*. Vieill. [*Phrenotrix*. Horsf.]

**** Subfam. *Paradiseana*.

Astrapia. Vieill.—*Parotia*. Vieill.—*Paradisea*. Linn. [*Manucodiata*. Briss.]—*Lophorina*. Vieill.—*Cicinnurus*. Vieill.—*Epimachus*. Cuv.?

***** — ?

Fregilus. Cuv. [*Coracias*. Briss.]—*Pyrhacorax*. Vieill.

IV. FAM. BUCERIDÆ. Leach. [Gen. *Buceros*. Linn.]

Buceros. Linn. [*Hydrocorax*. Briss.]—*Momotus*. Briss. [*Prionites*. Ill. *Baryphonus*. Vieill.]

V. FAM. LOXIADÆ. [Gen. *Loxia*. Linn.]

Phytotoma. Gmel.—*Coccothraustes*. Briss.—*Pitylus*. Cuv.—*Loxia*. Briss.—*Psittirostra*. Temm.—*Colius*. Linn.?—*Cissopis*. Vieill. [*Bethylus*. Cuv.]—*Strobilophaga*. Vieill. [*Corythus*. Cuv.]

TRIBUS IV. SCANSORES. Auct.

I. FAM. RAMPHASTIDÆ. [Gen. *Ramphastos*. Linn.]

Scythrops. Lath.—*Ramphastos*. Linn. [*Tucana*. Briss.]—*Pteroglossus*. Ill.

II. FAM. PSITTACIDÆ. *Leach*. [Gen. *Psittacus*. Linn.]

* Subfam. Psittacina.

Psittacus. *Auct.*—*Androglossa*.

** Subfam. Plectolophina.

Plectolophus. *Vieill.*—*Calyptrorhynchus*. *—*Microglossum*.
Geoff.

*** Subfam. Macrocercina.

Macrocercus. *Vieill.*

**** Subfam. Palæornina.

Psittacara.—*Nanodes*.—*Platycercus*.—*Pezoporus*. *Ill.*—*Palæornis*.—*Trichoglossus*.—*Lorius*. †—*Brotogeris*. ‡

***** Subfam. Psittaculina.

Psittacula. *Kuhl.*III. FAM. PICIDÆ. [Gen. *Picus*. *Bucco*. *Yunx*. Linn.]*Pogonias*. *Ill.*—*Bucco*. *Auct.*—*Picus*. Linn.—*Colaptes*.
Swains.—*Yunx*. Linn. [*Torquilla*. *Briss.*]IV. FAM. CErTHIADÆ. [Gen. *Certhiæ pars*. *Upupæ pars*. Linn.]*Dendrocolaptes*. *Herm.* [*Dendrocopus*. *Vieill.*]—*Certhia*.
Auct.—*Climacteris*. *Temm.*—*Orthonyx*. *Temm.*—* The genera *Calyptrorhynchus*, *Nanodes*, and *Trichoglossus* are among the New Holland groups lately described by Dr. Horsfield and myself.

† LORIUS.

Rostrum subattenuatum; *mandibulâ* superiore valde arcuatâ, compressâ, inferiore elongatâ fere integrâ.*Lingua* setosa, tubulosa?*Alæ* mediocres; *remige* 3tiâ longissimâ, 2dâ et 1mâ gradatim paulo brevioribus, 2dæ 3tiæ et 4tæ pogoniis externis in médio gradatim latioribus.*Pedes* mediocres.*Cauda* subbrevis, subgradata, ferè rotundata.Typus genericus. *Ps. domicella*, Linn.

‡ BROTOGERIS.

Rostrum attenuatum compressum: *mandibulâ* inferiore elongatâ vix emarginatâ.*Alæ* mediocres; *remigibus* tribus primis fere æqualibus.*Pedes* mediocres.*Cauda* subelongata, gradata.Typus genericus. *Ps. pyrrhopterus*. Lath.

Tichodroma. *Ill.* [*Petrodroma*. *Vieill.*]—*Upupa*. *Linn.*—*Sitta*. *Linn.*—*Xenops*. *Hoffm.*—*Orthotomus*. *Horsf.*—*Neops*. *Vieill.*—*Mniotilta*. *Vieill.*—*Thriothurus*. *Vieill.*—*Pyrrota*. *Vieill.*?—*Opetiorhynchus*. *Temm.*—*Oxyrhynchus*. *Temm.*

V. FAM. CUCULIDÆ. *Leach.* [Gen. *Cuculus*. *Trogon*. *Crotophaga*. *Linn.*]

Coccyzus. *Vieill.*—*Leptosomus*. *Vieill.*—*Cuculus*. *Auct.*—*Indicator*. *Vieill.*—*Centropus*. *Ill.* [*Corydonyx*. *Vieill.*]—*Saurothera*. *Vieill.*—*Phænicophaus*. *Vieill.*—*Crotophaga*. *Linn.*—*Trogon*. *Linn.*?—*Corythaix*. *Ill.*? [*Opæthus*. *Vieill.*]—*Musophaga*. *Isert.*?

TRIBUS V. TENUIROSTRES. *Cuv.*

I. FAM. NECTARINIADÆ.? [Gen. *Certhiæ* pars. *Linn.*]

Nectarinia.* *Ill.* [*Cæreba*. *Vieill.*]—*Dacnis*. *Cuv.*—*Furnarius*. *Vieill.*?

II. FAM. CINNYRIDÆ. [Gen. *Certhiæ* pars. *Linn.*]

Cinnyris. *Cuv.* [*Mellisuga*. *Vieill.*]—*Dicæum*. *Cuv.*—*Drepanis*. *Temm.*

III. FAM. TROCHILIDÆ. [Gen. *Trochilus*. *Linn.*]

Trochilus. *Auct.* [*Polytmus*. *Briss.*]—*Mellisuga*. *Briss.* [*Orthorhynchus*. *Lacep.*]

IV. FAM. PROMEROPIDÆ. [Gen. *Upupæ* pars. *Linn.*]

Promerops. *Briss.* [*Falcinellus*. *Vieill.*]

V. FAM. MELIPHAGIDÆ.†

Meliphaga. *Lessin.* [*Philedon*. *Cuv.* *Philemon*. *Vieill.*]

* There is much intricacy with respect to the subdivision of M. Illiger's genus *Nectarinia*. I have adopted Mr. Swainson's suggestion of applying *Nectarinia* to the *Honey-suckers* of America, and *Cinnyris* to those of the Old World. This mode will answer for the present; but a complete revision of the group is much wanting. I do not feel quite satisfied respecting the situation of M. Vieillot's genus *Furnarius*.

† This extensive and extraordinary family is at present in much confusion. I hope shortly with Dr. Horsfield's assistance to place it in some order. We have just characterized several distinct forms belonging to it, in the Linnean Society's Collection.

Melithreptus. *Vieill.*—Creadion. *Vieill.*—Mimetes. *King.*?
—Sericulus. *Swains.*? — Ptiloris. *Swains.* — Pomatorhinus.* *Horsf.*?—Prinia. *Horsf.*?

ORDO III. RASORES. *Ill.* [Gallinæ. *Linn.*]

I. FAM. COLUMBIDÆ. *Leach.* [Gen. *Columba.* *Linn.*]

Treron. *Vieill.* [Vinago. *Cuv.*]—*Columba.* *Auct.*—Ptilinopus. *Swains.*—Lophyrus. *Vieill.*

II. FAM. PHASIANIDÆ. [Gen. *Meleagris.* *Pavo.* *Phasianus.* *Numida.* *Linn.*]

Meleagris. *Linn.* [Gallo-pavo. *Briss.*]—*Pavo.* *Linn.*—Diplectron. *Vieill.* [Polyplectron. *Temm.*]—*Gallus.* *Briss.*—*Monaulus.* *Vieill.* [Lophophorus. *Temm.*]—*Phasianus.* *Auct.*—*Argus.* *Temm.*—*Numida.* *Linn.* [*Meleagris.* *Briss.*]

III. FAM. TETRAONIDÆ. *Leach.* [Gen. *Tetrao.* *Linn.*]

Liponyx. *Vieill.* [Cryptonyx. *Temm.*]—Odontophorus. *Vieill.*—Coturnix. *Cuv.*—*Perdix.* *Briss.*—Ganga. *Vieill.* [Pterocles. *Temm.*]—*Tetrao.* *Auct.*—*Lagopus.* *Vieill.*—Syrrhaptes. *Ill.* [Heteroclitus. *Vieill.*]—Ortygis. *Ill.* [Ortygodes. *Vieill.* Hemipodius. *Temm.*]—Tinamus. *Lath.* [Crypturus. *Ill.* Cryptura. *Vieill.*]

IV. FAM. STRUTHIONIDÆ. [Gen. *Struthio.* *Otis.* *Linn.*]

Rhea. *Briss.*—Struthio. *Linn.*—Casuarius. *Briss.*—Dromiceus. *Vieill.*—Didus. *Linn.* [Raphus. *Briss.*]—*Otis.* *Linn.*

V. FAM. CRACIDÆ. [Gen. *Crax.* *Linn.*]

Ourax. *Cuv.* [Pauxi. *Temm.*]—*Crax.* *Linn.*—Penelope. *Merr.*—Ortalida. *Merr.*—Opisthocomus. *Hoffm.*? [Orthocorys. *Vieill.*]—Menura. *Lath.*—Megapodius. *Temm.*

* I feel some doubt whether the above genera *Pomatorhinus* and *Prinia* belong to the present family or to the *Certhiidae*. The formation of their tongue and the nature of their food, at present unknown, will determine this point.

ORDO. IV. GRALLATORES. *Ill.* [Grallæ Linn.]

I. FAM. GRUIDÆ. [Gen. *Ardeæ* pars. *Psophia*. Linn.]

Psophia Linn.—*Anthropoides*. Vieill.—*Balearica*. Briss.—*Grus*. Pall.—*Cariamia*. Briss. [*Dicholophus*. *Ill.* *Lophorhynchus*. Vieill. *Macroductylus*. Geoff.]

II. FAM. ARDEIDÆ. Leach. [Gen. *Ardeæ* pars. *Cancroma*. *Phænicopterus*. *Platalea*. *Mycteria*. *Tantalus*. Linn.]

Aramus Vieill.—*Eurypyga*. *Ill.* [*Helias*. Vieill.]—*Ardea*. Auct.—*Cancroma*. Linn. [*Cochlearius*. Briss.]—*Phænicopterus*. Linn.—*Platalea*. Linn. [*Platea*. Briss.]—*Ciconia*. Briss.—*Mycteria*. Linn.—*Scopus*. Briss.—*Anas-tomus*. *Ill.* [*Hians*. Lacep.] — *Tantalus*. Linn. — *Ibis*. Lacep. [*Falcinellus*. Bechst.]

III. FAM. SCOLOPACIDÆ. [Gen. *Scolopax*. *Recurvirostra*. *Tringa*. Linn.]

Numenius. Briss.—*Totanus*. Bechst. [*Actitis* pars. *Ill.*]—*Recurvirostra*. Linn. [*Avocetta*. Briss.] — *Limosa*. Briss. [*Actitis* pars. *Ill.* *Limicola*. Vieill.]—*Ereunetes*. *Ill.*—*Macroramphus*. Leach. ?—*Scolopax*. Auct. — *Rusticola*. Vieill.—*Rynchæa*. Cuv. [*Rostratula*. Vieill.] — *Machetes*. Cuv. [*Actitis* pars. *Ill.*]—*Pelidna*. Cuv.—*Phalaropus*. Briss. [*Crymophilus*. Vieill.]—*Lobipes*. Cuv. [*Phalaropus*. Vieill.] — *Tringa*. Auct. [*Actitis* pars. *Ill.*]—*Phæopus*. Cuv.

IV. FAM. RALLIDÆ. Leach. [Gen. *Parra*. *Palamedea*. *Rallus*. *Fulica*. Linn.]

Parra. Linn. [*Jacana*. Briss.]—*Palamedea*. Linn. [*Anhima*. Briss.]—*Chauna*. *Ill.* [*Opistolophus*. Vieill.]—*Glareola*. Briss.—*Rallus*. Auct.—*Chionis*. Forst. ? [*Vaginalis* Gmel.] — *Crex*. Bechst. [*Ortygometra*. Steph.]—*Gallinula*. Briss.—*Porphyrio*. Briss.—*Podoa*. *Ill.* [*Heliornis*. Vieill.]—*Fulica*. Auct.

V. FAM. CHARADRIADÆ. Leach. [Gen. *Charadrius*. *Hæmatopus*. Linn.]

Hæmatopus. Linn. [*Ostralega*. Briss.]—*Calidris*. Ill. [*Arenaria*. Briss.]—*Falcinellus*, Cuv.—*Erolia*. Vieill.?—*Cursorius*. Lath. [*Tachydromus*. Ill.]—*Strepsilas*. Ill.—*Squatarola*. Cuv.—*Vanellus*. Briss. [*Tringa*. Ill.]—*Pluvianus*. Vieill.—*Charadrius*. Auct. [*Pluvialis*. Briss.]—*Borhinus*. Ill.? * — *Himantopus*. Briss. [*Macrotarsus*. Lacep.]—*Ædicnemus*. Cuv.

ORDO V. NATATORES. Ill. [*Anseres*. Linn.]

I. FAM. ANATIDÆ. Leach. [Gen. *Anas*. *Mergus*. Linn.]

* Subfam. Anserina.

Anser. Briss. — *Bernicla*. Steph. — *Cheniscus*. Brookes's MMS.—*Chenolopex*. Steph.—*Plectropterus*. Leach.

** Subfam. Cereopsina.

Cereopsis. Lath.

*** Subfam. Anatina.

Tadorna. Leach.—*Cairina*. Flem.—*Anas*. Auct.—*Dafila*. Leach.—*Mareca*. Steph. — *Querquedula*. Ray. — *Rhyrchospis*. Leach.

**** Subfam. — ? †

Clangula. Flem.—*Harelda*. Ray.—*Fuligula*. Ray.—*Mergus*. Linn. [*Merganser*. Briss.]—*Somateria*. Leach.—*Oidemia*. Flem.—*Biziura*. Leach.

***** Subfam. Cygnina.

Cygnus. Meyer.

* I have not seen the species on which this genus is founded.

† The above disposition of the *Anatidæ* exhibits a slight deviation from that drawn out in my paper on "the Affinities of Birds," and adopted from it by my friend Mr. Stephens in the "General Zoology." I do not think, upon consideration, that the two subfamilies of the "*Canards proprement dits*" of M. Temminck can be said to be so far separated from each other, as by the intervention of another subfamily: while *Cygnus* appears to hold a separate station of equal rank with the other subfamilies. The series of affinity however remains unaltered: a partial change only takes place in the mode of selecting the types of each subfamily. *Mergus* seems to belong to the fourth subfamily, but to be at the extremity of it; in fact to be osculant between the families of *Anatidæ* and *Colymbidæ*.

- II. FAM. COLYMBIDÆ. *Leach*. [Gen. *Colymbus*. Linn.]
Podiceps. Lath. [Colymbus. *Briss. Ill.*].—*Colymbus*. *Auct.*
 [Mergus. *Briss.* Eudytes. *Ill.*]
- III. FAM. ALCADÆ. [Gen. *Alca*. Linn.]
Uria. *Briss.*—*Cephus*. *Cuv.?*—*Mergulus*. *Ray.*—*Phaleris*.
Temm. [Alca. *Vieill.*].—*Fratercula*. *Briss.* [Mormon. *Ill.*
Larvæ pars. *Vieill.*].—*Alca*. *Auct.* [Larvæ pars. *Vieill.*]
 —*Spheniscus*. *Briss.*—*Catarrhactes*. *Briss.*—[*Eudyptes*.
Vieill.].—*Aptenodytes*. *Forst.*
- IV. FAM. PELECANIDÆ. *Leach*. [Gen. *Pelecanus*. *Phaëton*. *Plotus*.
 Linn.]
Onocrotalus. *Briss.*—*Phalacrocorax*. *Briss.* [Carbo. *Meyer*.
Haliæus. *Ill.* *Hydrocorax*. *Vieill.*].—*Sula*. *Briss.* [Dyspo-
 rus. *Ill.* *Morus*. *Vieill.*].—*Tachypetes*. *Vieill.*—*Phaëton*.
Linn. [Lepturus. *Briss.*].—*Plotus*. *Linn.* [Anhinga. *Briss.*]
- V. FAM. LARIDÆ. *Leach*. [Gen. *Sterna*. *Rhynchops*. *Larus*.
Diomedea. *Procellaria*. Linn.]
Sterna. Linn.—*Rhynchops*. Linn. [Rygchopsalia. *Briss.*].—
Larus. *Auct.*—*Stercorarius*. *Briss.* [Lestris. *Ill.* *Prædatrix*.
Vieill.].—*Diomedea*. Linn. [Albatrus. *Briss.*].—*Haladroma*.
Ill.—*Procellaria*. *Auct.*—*Pachyptila*. *Ill.*—*Puffinus*. *Ray*.
 —*Thalassidroma*. (*)

* THALASSIDROMA.

Rostrum subbreve attenuatum, compressissimum, apice subitò deorsum cur-
 vato: *naribus* prominentibus in tubum unum conjunctis.

Alæ longæ acuminatæ; *remige* 1mâ 3tiâ breviori, 4tâ longiori, 2dâ long-
 issimâ.

Pedes subgraciles; *tarsis* elevatis, *acrotarsiis* *paratarsiisque* integris.

Typus genericus. *Procellaria pelagica*. Linn.

[To be continued.]

ART. XLV. *Analytical Notices of Books.*

The Animal Kingdom described and arranged in conformity with its Organization, by the Baron CUVIER. With additional Descriptions of all the Species hitherto named; of many not before noticed; and other original matter. By EDWARD GRIFFITH, F.L.S. and others. Vol. I—III. 4to and 8vo. with numerous Plates.

A MERE translation of a work so universally known as the *Regne Animal* of the Baron Cuvier, could not, however well executed, fall properly under our notice in this department of the Journal; but the publication of Mr. Griffith, as may be seen from its title quoted above, is of so different a character as to claim in the light of an original production some portion of our attention. The translation bears in fact so small a proportion to the other valuable matter contained in these pages, as to occupy, though printed in a larger type than the remainder of the work, less than one-sixth of the volumes hitherto published. To this it is unnecessary further to advert than to assign to it its just praise of fidelity; and we shall therefore content ourselves with briefly pointing out the principal features which contribute to throw an air of originality over the whole undertaking. These consist of a biography of the principal species, of a history of the progress of zoological knowledge in the leading divisions, and of a synopsis of the characters and synonyms of all the animals hitherto described, which is given in portions corresponding with the text of the original author.

The biographical part, which forms the bulk of the work, is extremely valuable and interesting. The original observations contained in it are, it is true, not numerous, neither is it possible that they should be so, in consequence of the very scanty opportunities possessed in this country of studying the manners of the living animals. Were these opportunities even more frequent than they are, it is moreover doubtful how far they should be

relied on, and to what extent they should be regarded as capable of illustrating the natural characters, habits, and instincts. Obtained as all information derived from such a source must be from observing the animals in a captive and consequently artificial state, it is of course far inferior in value to that which is furnished by those qualified travellers who have been enabled to study them in the freedom of nature. Mr. Griffith has therefore very properly endeavoured to avail himself as far as possible of the observations of this latter description of persons, and has had recourse only in the absence of information of this more authentic description, to the works of those whose opportunities have been limited to the animals in confinement. From both these sources he has drawn freely and with judgment: he has also added occasionally the results of his personal observations and of those of a few intelligent friends, and has thus brought together materials far superior to those which have been hitherto exhibited in works on animal biography.

In the remaining portions, which are more closely connected with what may be strictly termed the science of Zoology, nearly the same plan is pursued. The works of the best writers are put in requisition, and the most modern among them being consulted, a more extensive list of species is thus supplied than any which had been previously given. This is further enlarged by the contributions of several able naturalists, and among these of Major Hamilton Smith, to whom the author is indebted for some short but excellent Monographs, and who has moreover promised to furnish the species of the very interesting family of Antelopes, to which he has long paid particular attention, and in which he is better versed than any living Zoologist. In the Synopsis of the species the system of Cuvier is generally followed, the characters and synonyms being carefully selected as well from systematic authors, as from those who have restricted themselves to the elucidation of only single groups or animals, and even from the works of such travellers as have merely described those which fell under their own observation. This section of the work, which is separately paged for the purpose of being bound in a distinct form, if it should be considered desirable, will consequently prove

a valuable manual for the student of Zoology, and will, when finished, constitute as complete a system of the animal kingdom as the present state of our knowledge will furnish.

The numerous figures of animals, with which the present volumes are illustrated, are executed in a superior manner. It is indeed sufficient to observe on this point, that many of them are engraved from the drawings of Major Hamilton Smith and of the Landseers. Than this no stronger proof of their accuracy and spirit can be required.

From this general notice it will be evident that the work of Mr. Griffith, though claiming at first view merely the character of a translation of the *Regne Animal*, is in many respects more adapted than that celebrated production of the first Zoologist of the age to the use of the tyro. That it is well calculated to advance in this country the study of Zoology, is a still further recommendation of it to our favour. The mass of popular and pleasing information which it contains is admirably qualified to excite in the mere reader for amusement, a desire to become more intimately acquainted with the beings, the biography of which is found to be so interesting. For the knowledge required for this purpose it will not now be necessary to turn to the works of other authors; the same volumes which contain the attraction supplying also that scientific view of the animal kingdom, which will be found amply sufficient to gratify his desires. As the work proceeds, it is stated that its Zoological value will also increase, M. Cuvier having promised to enrich it with such new facts and discoveries as he may consider necessary to the more complete illustration of his views. It will thus possess an additional advantage over its original, and a still stronger claim upon the support of the Zoologist and of the public.

British Entomology; or Illustrations of the Genera of Insects,
 &c. By JOHN CURTIS, F.L.S. Nos. xix.—xxi.

THE nineteenth number of this collection contains, 1. *Licinus depressus*. 2. *CHARICLEX Delphinii*, the Pease-blossom Moth of the collectors, an extremely rare insect, which forms the type

of a new genus allied to *Cucullia*, but distinguished by its maxillæ, wings, and abdomen being much shorter, its palpi being completely concealed by scales, the under side of the antennæ very hairy, and the anterior tibiæ shorter than the basal joint of the tarsi. It is moreover peculiar in having two naked horny spines attached to the extremity of the anterior tibiæ, a conformation which Mr. Curtis has never seen in any other species. 3. *Mutilla Ephippium*, ♂ and ♀, the latter being the *M. rufipes* of Fabricius. 4. *Tabanus alpinus*, a species new to Britain; with very detailed dissections of the complicated structure of the mouth.

In the twentieth number we are presented with, 1. *Gyrinus bicolor*, Fab. (*G. elongatus*, Marsham). 2. *Parnus impressus*, a new species from the author's cabinet. 3. *LOBOPHORA polycomata*, a new genus embracing the Seraphims of Collectors, the *Phalænæ hexapterata*, *sexalisata*, &c. of Haworth's *Lepidoptera Britannica*. 4. *Acrida Bingleii*, a new species.

The twenty-first number embraces, 1. *Chlœnius sulcicollis*, new to this country. 2. *Xanthia Centrago*, the *Noctua Centrago* of the *Lepidoptera Britannica*. 3. *Colletes fodiens*; *Melitta* **a* of Kirby's *Monographia Apum Angliæ*. 4. *ANEURUS lævis*, a Cimicidous insect, separated from *Aradus* of Fabricius, in consequence of the second joint of its antennæ being shorter than the two succeeding ones, the rostrum shorter than the head, scutellum broad and short, and the elytra destitute of nervures; the generic name being derived from this latter circumstance.

In these numbers Mr. Curtis has again in many instances given under the respective genera their distribution into sections, together with the names of the British species referable to each. He has even done more to assist the entomological student, by furnishing him under *Parnus* with a short monograph of the species found in this country, including two which had previously remained undescribed. It would be adding much to the labour of the author were he to continue his work on this plan, but it would also materially increase its utility; every plate becoming in fact, with its accompanying letter-press, a sufficient monograph of the genus for the purposes of the British collector.

Journal of the Academy of Natural Sciences of Philadelphia, 8vo.
Vol. iv. Part i. pp. 200. Plates xiii. and Part ii. No. i.

HIGHLY creditable as have been the previous volumes of this Journal to the Society from which they have emanated, and to the authors of the Papers contained in them, the present is not inferior to its predecessors in value and interest. Devoted to the development in its various branches of the Natural History of the northern part especially of the vast continent of America, this object is pursued with a zeal which merits the warmest praise. With the opportunities afforded by the extensive field, hitherto only partially explored, in the cultivation of which these active naturalists are engaged, the result of their labours cannot fail to be extremely beneficial to the general advancement of the science. On the attention of the Zoologist in particular this publication possesses peculiar claims, the study of the animal kingdom appearing to form the favourite department of inquiry. Ample evidence of this is furnished by the numerous notices contained in it, which embrace almost every class of animated nature. Of these we propose to offer a brief analysis, and to revert from time to time to the succeeding volumes as they continue to appear.

The only paper relative to recent Mammalia, is the description, by Dr. Poeppig of Leipzig, of a new species of *Capromys*, *C. prehensilis*, "Tail elongated, cylindrical, as long as the body; head, soles of the anterior and posterior feet, and claws, white." In consequence of this new discovery it has become necessary to characterize the original species, *C. pilorides*, (the *C. Furnieri*, Desm. Zool. Journ. Vol. I. p. 81, and *Isodon pilorides*, Say, Ib. p. 230); which is thus done by Dr. Poeppig; "Tail short, one third of the length of the body; head of the same colour; soles of the anterior and posterior feet, and claws, black." The former of these is termed by the Spaniards of Cuba, *Agutia Caravalli*, from a fancied resemblance in its slothful and melancholy habits, its slow motions, and insatiable hunger, to the African tribe named Caravalli; the same principle assigning to the latter the denomination of *Agutia Congo*, from its similarity to the Congo

African in its activity, its constantly lively countenance, &c. Both species inhabit the Island of Cuba, the *C. prehensilis*, which is rare, being found only towards the southern coasts, in an almost uncultivated country, covered with thick woods, as in the Partido de las Piedras, ad Macuriges, ad Masmariges, &c. It uses its long tail with amazing dexterity, frequently eluding the pursuit of the hunter by seizing with it the branch of a tree, and hiding itself amidst the innumerable and frequently pendulous plants which cover the more lofty trees of those tropical regions. In its manner of life and of feeding it agrees with the *C. pilorides* which is much more common, and is a stupid, nocturnal animal. From these characters we are inclined to suspect that Dr. P. has misapplied the Spanish names by which he states the species to be designated. The weight of the *C. prehensilis* is from seven to nine pounds; that of the *C. pilorides* being from twelve to sixteen, and the description of Desmarest having consequently been taken from a young individual.

The body of the *Capromys prehensilis* is almost cylindrical, becoming slightly larger towards the pelvis, especially in the female. Colour of the back formed from a mixture of grey and ferruginous. Hairs black, and very soft at the base, grey in the middle, and ferruginous and rigid at their apices. Fur dense, especially on the back. Neck short, densely covered with short adpressed yellowish hairs. Forehead, cheeks, and throat, yellowish white. Breast and abdomen white, with an obscure stria on each side. Pubic region naked. Base of the tail ferruginous, skin griseous, the remaining portion cylindrical; naked above towards the apex. Toes covered with rigid, hoary, shining hairs. Head hoary? slightly flattened on the front; ears ovate, ciliate, naked on the outside; within hairy, black. Eyes oblique, aperture of the lids ovate; lids black on their margins; ciliæ short and black. Snout acute, truncate, naked, very moveable, black. Nostrils forming an oblique angle with the upper jaw, linear, in the living animal ovate. Lips thick, white; the upper one furrowed, and almost cleft, by a deep sulcus commencing between the nostrils; the lower one entire. Aperture of the mouth transverse; when the jaws are extended, ovate; in this state the molar teeth

are not visible. Whiskers long, patent, moveable, white, and shining. Neck short, strong, and muscular; circumference of the head retractile between the shoulders. Length to the insertion of the tail twelve inches eleven lines; of the tail, twelve inches three lines.

In the department of Ornithology the paper is also single; but it is one which by its extent and importance leaves no deficiency to be regretted in this branch of our studies. The American Ornithology of Wilson is a work so generally known and esteemed as to require from us no commendation. The production of an accurate and able observer, who can scarcely be surpassed in the skill and intelligence with which he describes the habits as well as the plumage of the numerous birds to which he refers, it is extremely desirable that it should be rendered as extensively available as possible to the purposes of science, by collating it with the productions of other and more modern writers, and thus establishing for it a correct synonymy. This labour has been undertaken by Mr. Charles Bonaparte, a young ornithologist of considerable abilities, to whom we have already had occasion to refer, and who is peculiarly qualified for the task, as well by his acquirements as by his residence in the country in which the species quoted are to be found. In his observations "on the Nomenclature of Wilson's American Ornithology," he does not however confine himself to the mere enucleation of the synonyms, but offers, as the occasion presents itself, his own opinions on the modern subdivisions with a freedom and a judgment which induce us to augur well of his future exertions. Among these we are to anticipate a continuation of the work on the nomenclature of which he is at present engaged.

Among the *Reptilia*, the papers are more numerous, including two from the pen of Mr. Say, and one from that of Dr. Harlan. In an account of "The Freshwater and Land Tortoises of the United States," the former gentleman describes one species of *Testudo*; nine of *Emys*; three of *Terrapena*, Merr. (*Cistuda*, Say); one of *Chelonura*; and one of *Trionyx*. The whole of these have been previously described, with the exception of one of the species of *Emys*, *E. biguttata*, "Shell oblong oval, slightly

contracted in the middle, each side; anterior marginal scuta very narrow, linear; occiput with two very large fulvous spots; superior jaw emarginate, inferior jaw acute; tail rather long, simple. The length of the shell is three inches and four-fifths; its greatest breadth, two inches and four-fifths; and its breadth in the middle, two inches and two-fifths.

The other paper by Mr. Say contains "Descriptions of three new species of *Coluber*, inhabiting the United States," 1. *C. amarus*; "Above brown or blackish; beneath bright red; tail short, with an abrupt solid conic tip." Inhabits Pennsylvania. Length ten inches and three-tenths; of the tail one inch and three-fifths. 2. *C. rigidus*: "Dark fuscous or blackish; beneath yellow, with two black lines." Inhabits the Southern States. Length, twenty inches and three-fifths; of the tail, four inches. 3. *C. septemvittatus*: "Brownish, with three blackish lines; beneath yellow, with four blackish lines." Inhabits Pennsylvania. Length, nine inches and two-tenths; of the tail, two inches and a half.

In the "Description of two species of the Linnean genus *Lacerta*, not before described, and construction of a new genus *Cyclura*," Dr. Harlan points out the osculant position of these animals between *Iguana* and *Stellio*, and assigns to the subgenus which he has established to receive them, the following characters. "CYCLURA. Palate deprived of teeth; tongue fleshy and extensible, cleft at the tip; skin of the throat folded transversely; back furnished with a flexible crest or fringe: tail, about half the total length," furnished with numerous elevated spinous rings; "scales which form the elevated rings separated by two or more rows of depressed spineless scales above." The species described are both natives of America. 1. *C. carinata*. "Crowns of the teeth dentated; a row of corneous scales lining the infra-orbital ridge; dorsal crest wanting between the scapulæ, and also over the sacrum; scales of the body uniform, square, small, slightly imbricate, and spineless: legs and feet furnished with scales, having minute spines pointing downwards: tail carinated above and slightly compressed in the middle; spiny bands terminating four inches from the extremity, and separated from each other by

three rows of depressed scales." Inhabits Turk's Island. Total length two feet four inches; length of the tail, one foot three inches. 2. *C. teres*. "Teeth small, uniform and pointed; dorsal crest wanting only over the sacrum; scales on the sides, thighs, and legs, bristled over with minute spines; tail cylindrical, tapering gradually towards the point; spiny rings encircling the tail, separated by two rows of depressed scales without spines above; spines on the rings nearly equal, extending to the end of the tail." From Tampico. Total length one foot eight inches and a half; length of the tail eleven inches.

In Ichthyology there occur two articles; one being a "Description of a new species of Fish of the Linnean genus *Perca*, by J. Gilliams," which he refers to the genus *Scolopsis* of Cuvier, and describes by the trivial name of *Sayanus*; and the other being "Descriptions of several species of the Linnean genus *Raia*, of North America, by Mr. C. A. Lesueur." In this latter are described three species of *Raia*, Cuv. the *R. Desmarestia*, *R. eglantiera*, and *R. Chantenay*: one of *Trygon*, Adans., the *T. sabina*; one of *Myliobatis*, Dum. the *M. Freminvillii*; and one of *Cephaloptera*, the *C. giorna*.

In recent Conchology there is only an incidental notice contained in the "Account of some of the Fossil Shells of Maryland, by T. Say." In this the industrious author points out the necessity for establishing a new genus under the name of *DISPORÆA*, which is thus characterized: "Shell univalve, conoidal, patelliform, with an internal entire cup-shaped appendage, adhering by its side and apex to the side of the shell." Its type is a recent species from South America, described by Mr. Say as *D. tubifera*, but which appears to be identical with the cup-and-saucer limpet, as it is termed by the dealers, the *Calyptrea auriculata*, Chemn. and *C. extintorium* ? of Sowerby's Genera, a shell which Mr. Say does not seem to have been previously acquainted with. The other species which he refers to it are, *D. grandis*, fossil, ovate, concentrically wrinkled, and destitute of spines or processes; and *D. costata*, previously described by him as a *Calyptrea*.

The continuation by the same gentleman of his "Descriptions of Coleopterous Insects collected in the late expedition to the

Rocky Mountains," is the only Entomological article. It is concluded in the present volume, and contains characters and descriptions of several hundred new species, arranged according to the system of M. Latreille.

In the "Description of several new species of *Holothuria*, by C. A. Lesueur," that gentleman remarks that the form of the body of these animals, and the arrangement of the feet, which are adopted as leading characters by Blainville and Cuvier, are too variable, and frequently too indistinct from contraction in spirits, to afford a certain guide. He therefore divides them into sections according to their tentacula. Of the first of these sections, "With cylindrical tentacula; summit terminated by a branched, flat, spherical, or infundibuliform umbel," four new species are described; two being referred to the second, with "arborescent tentacula;" and two to the third, in which the "tentacula" are "pinnated, and the body vermiform."

Of geological articles, connected with Zoology, there are three, the "Description of the Os Hyoides of the *Mastodon*, by Dr. Godman;" the description of an "extinct species of Crocodile, from New Jersey, by Dr. Harlan;" and a "Notice" by the latter gentleman, "of the *Plesiosaurus* and other Fossil Reliquiæ from the State of New Jersey."

Histoire Naturelle des Mammifères, &c.—Natural History of the Mammalia, with original coloured Figures, designed after the living Animals. Published under the authority of the Administration of the Museum d'Histoire Naturelle, by M. GEOFFROY SAINT-HILAIRE, and M. F. CUVIER. Elephant folio. Nos. XLI.—L.

AT the advanced stage of this publication at which our Notices commence, it is unnecessary to dilate upon the splendid style in which it is brought out, or on the ability and fidelity that characterise as well the figures as the descriptions contained in it, since these must be well known to all who have seen any of the previous numbers. Suspended for a considerable period after the

termination of the first two volumes, it seemed almost as though the undertaking had proved too extensive to be continued on the liberal plan on which it had been commenced. About the middle of the last year however, the publication was resumed in a style fully equal to its earlier portions, and the succeeding numbers have since appeared with regularity. As it will doubtless form the standard work of reference for the Mammalia, we trust that such encouragement will be extended to it as will ensure its completion. Necessarily too expensive for general circulation, public libraries and the collections of the rich can alone possess it; but to these it is almost indispensable; while the manner in which it is executed renders it worthy of a place by the side of their most costly and elegant volumes.

It is not our intention to enter into a general account of the contents of these numbers, much of which is of necessity well known to every zoologist; but merely to look to them occasionally for the purpose of noticing the new matter they may contain, either with reference to animals now first described, or to those improved views of the science which the conjoined industry of fellow-labourers in the same cause, though in different climates, may succeed in eliciting. In both these respects the present numbers are rich; and several of the new animals contained in them possess a still higher interest as tending to elucidate the connection between the different groups.

The first of these which we shall notice, is an animal from the western coast of Africa, described under the name of *Mangue*, and belonging to the *Viverrine* or *Marten* family. In general appearance it approaches more nearly to the *Mangoustes* (*Herpestes*, Ill.) than to any other genus of this group, but its form is more compact, and its head more rounded; the snout is also more lengthened, in which respect, and in its perfectly plantigrade motion, it resembles the *Suricate* (*Ryzana*, Ill. *Viverra tetradactyla*, L.). The osculant position between the *Mangoustes* and the *Suricate*, indicated by these external marks is further confirmed by other characters. The teeth of the *Mangue* agree in number with those of the *Suricate*, but in form with those of the *Mangoustes*; with the latter it corresponds moreover in its

toes, claws, and genital organs; while it resembles the former in the extraordinary anal pouch, in consequence of which M. F. Cuvier has distinguished by the name of *CROSSARCHUS* the new genus of which it forms the type; the single species described, and of which only one individual is known, being termed *obscurus*.

The snout of the Mangue is very moveable, and prolonged half an inch beyond the jaws. It is terminated by a muzzle, on the margins of which the nostrils are situated, nearly as in the Dog. The tongue is free, and capable of considerable elongation; in the middle it is armed with corneous papillæ, its sides being soft. The eyes possess a third imperfect eyelid, and their pupils are round. The ears are small and rounded, with two very prominent lamelliform lobes placed one above the other in their concavity. The fur is composed of two kinds of hairs, both of which are rough. The woolly ones are numerous, but are covered almost entirely by the silky ones, some of which are an inch and a half long; they are however very short on the head and limbs, and the tail appears to be furnished with them only on its upper and under surfaces, those of the sides inclining in these directions, perhaps because the animal habitually sleeps on it in such a manner as to produce this effect. The hairs of the whole body are not laid in similar directions and sleek, as is usually the case in healthy animals; on the contrary they incline irregularly in various directions, a deviation from general appearances, which is also exhibited in a minor degree by some of the Mangoustes. The tail is not so long as that of the Mangoustes; it is not suffered to drag upon the ground, neither is it carried above the back, its usual position being curved downwards.

The colour of this new animal is brown throughout, being paler on the head, and slightly yellower on the anterior than on its posterior parts; an appearance which results from the hairs being deep brown at their base and tipped with yellow, and this latter portion of them being longer towards the neck and shoulders than on the hinder part and thighs. Length of the head, three inches and a half; of the body, eight; of the tail, seven: medium height, five inches.

Between the viverrine family, to which the last described animal belongs, and that which is composed of the Racoons and Bears, there has hitherto existed a considerable gap, which is now in a great measure filled up by the newly discovered forms which we shall next notice; the Benturong, and the Panda. The former of these, which has been known in Europe for several years, forms the type of a new genus now first described under the name of *ICTIDES*, a denomination affixed to it by M. Valenciennes, from whose pen some observations on the subject appeared in the *Annales des Sciences Naturelles* in January of the present year.

The external appearance of the *Ictides* corresponds in some degree with both that of the Civets and that of the Racoons; having the plantigrade motion of the latter and the slender snout of the former. But it is separated from both by its prehensile tail; and by its teeth, which bear some resemblance to both these genera. It has, like the Civets, one tubercular molar tooth in the lower, and two in the upper, jaw; but these teeth, as well as all the other true molars, are so thickened as to approach very nearly to those of the Racoons. The *Ictides* is completely plantigrade, and has on each foot five toes armed with strong compressed claws, apparently adapted for climbing. Its tail, the thickness of which at its commencement is almost monstrous, is prehensile beneath, without being terminated by a naked skin like that of the *Ateles*, but resembling entirely the tail of the Sajous. The eye, like that of the Domestic Cat, has the pupil vertically elongated; the habits of the *Ictides* are consequently nocturnal. The ears are small and rounded; and the nostrils are surrounded by a muzzle, which is divided into two portions by a deep sulcus. The hairs are long and thick; and a peculiar character is given to the physiognomy by the moustaches, which are very voluminous on the lips, the eyes, and the cheeks, and by the pencil of long and numerous hairs which terminates the ears. The cry is intermediate between those of the Cat and of the Dog.

The *Ictides albifrons*, to which the preceding generic description chiefly refers, is of the size of a very large Domestic Cat. The colour of its fur is generally gray, resulting from silky hairs, which are black at their base, and white in their extreme third.

The sides of the snout and of the forehead, are black, as well as the pencil which terminates the ears, these organs being bordered with white. The upper part of the snout and the forehead are white. Iris yellow. Belly gray, its hairs being entirely of that colour and shorter than those of the upper parts. In another specimen the sides of the snout, and the tail, its extremity excepted, are gray. This species is a native of Boutan.

There is also a second species of *Ictides* described and figured, the *I. ater*, from Malacca. It differs from the preceding in size and colour. Its size is that of a large Dog; and its colour is entirely black; with the exception of a few white hairs on the forehead, in the pencil of the ears, and on the feet; the upper part of the snout is yellowish, and the eyes brown.

The Panda, which forms the other connecting link to which we have adverted between the Civets and the Bears, is known only by the skin, containing the anterior portion of the jaws and the feet, and by a drawing, both of which were sent from India by M. Duvaucel. From these it is evident that it constitutes the type of a new genus, termed by M. F. Cuvier, on account of its external resemblance to a Cat, *Ailurus*, and to which only this one species is yet referable, the trivial name assigned to it being *fulgens*, from the brilliancy of its colours.

The dentary system of the *Ailurus* is developed by M. F. Cuvier at considerable length. The incisors, and the canine teeth are those of the *Carnivora*; the former being six in number in each jaw, and appearing to have been lobed when young. The superior canine teeth, instead of being curved like those of the Cats, the Martens, and the Dogs, are nearly straight, resembling in this respect those of the Racoons (*Procyon*, Storr.); they are trenchant posteriorly, and are marked with two longitudinal grooves on each of their surfaces. The lower canine are slightly curved, and are also longitudinally grooved. The molar teeth remaining in the upper jaw are three in number. The first, which almost touches the canine, is a false normal molar; immediately after this comes a true molar, having on its outer part three tubercles placed in the longitudinal direction of the jaws, and separated from each other only by a slight depression, the middle being the

largest, and on its inner part two tubercles, very distinct from each other, and much less elevated than the outer ones, the posterior being larger than the anterior; the third, is a second true molar, larger than the preceding one, from which it differs only in its two internal tubercles being of equal size; and in a third being developed at their base. In the lower jaw, almost adjoining the canine tooth, is a false normal molar; which is succeeded by a true molar composed of a small anterior tubercle, of a very large middle one, which is much thicker on the faces of the tooth than in its middle, and of a posterior crest, which is more elevated towards the external than the internal surface of the jaw, and forms a portion of a circle.

This dentary system appears to approach more nearly to that of the Racoons than to any other genus of the *Mammalia*. In the upper jaw the incisors and canine teeth of the Panda correspond precisely with those of the Racoons; and the first true molar differs only in having in the latter the anterior internal tubercle largest instead of the posterior. The remaining teeth are however very distinct. The Racoon possesses three false molar teeth instead of one; and its second true molar has a totally different structure, its tubercles being obtuse and resembling those of the Bears, while in the Panda they are distant and acute, and similar to the true molar teeth of the insectivorous *Mammalia*. In the lower jaw the differences are analogous. The Panda possesses only one false molar instead of three; and its true molars can only be reconciled to those of the Racoons by dividing, in imagination, the middle tubercle which is, as has been noticed, thinner in its central part, and also dividing the posterior crest, so as to form of each two tubercles.

The jaws not being entire behind, the absolute number of molar teeth in the Panda cannot be determined except from analogy. No carnivorous quadruped possesses more than three true molar teeth on each side; and that the Panda has this number is evident from the remains of the roots of a third true molar in the lower jaw. From these it is plain that this tooth was very large, and the corresponding one, which is wanting in the upper jaw, no doubt agreed with it in size. In their tubercles these deficient

teeth probably differed only in size from the preceding ones, for it is an established fact that the posterior true tubercular molars in each jaw, are always formed on the same model. We are hence enabled to judge of the size of the snout of the Panda, which differs singularly from that of the other *Carnivora*, with which it appears to be most closely connected. The anterior part of its head cannot in fact project more than that of the Domestic Cat; and this is also shown by the drawing which M. Duvaucel transmitted with the skin. It is completely plantigrade, and there are five toes on each foot, armed with half-retractile claws, like those of the Martens and the Civets; the soles of the feet are also covered with hairs, all of which circumstances tend to remove still farther the Panda from the Racoons.

The size and proportions of the Panda are those of a large Domestic Cat. Its fur is very thick. The head is white, with the exception of the snout and the under part of the lower jaw, which are black, and of a brown spot on the cheeks. The hinder part of the head, the neck, and the shoulders, are of a very brilliant red-brown; the remainder of the body to the origin of the tail is fulvous, becoming brownish behind and on the lower part of the thighs; the limbs, under part of the neck, chest, and belly are black. On the front of the anterior legs there is a brown spot, and all the toes have a few fulvous hairs. The tail has five or six fulvous and brown rings, and its extremity is brown.

Although it is by no means our intention to notice such animals as appear to possess no other claim to attention than what arises from their not having been previously described, we cannot refrain from adverting to a new species of Bear from South America, which is peculiarly interesting as being the only one that has yet been discovered in the whole extent of that vast continent. In its fur it is associated with the Black Bear of North America, and with the Indian Bears. Like these its hairs are smooth and shining, and of a black tinge upon the greater part of the body. The snout is of a dirty fulvous hue, as are also two semicircles surrounding the upper part of the eyes, and arising from a common point between them. The cheeks, the lower jaw, the neck, and the chest, as far as between the fore legs, are white. All these

colours are produced by silky hairs ; the woolly ones, which are brown, being entirely hidden. The moustaches of the lips are black, while those of the eyes are white. The snout is short, and strongly separated by a depression from the cerebral portion of the head, which is remarkable for its capacity. The length from the tip of the nose to the posterior part of the body in the young individual described, was three and a half feet ; the height to the shoulders being fifteen inches. It inhabits the Cordilleras of Chili, and has received from M. F. Cuvier the trivial name of *ornatus*.

It is much to be regretted that the able author of this notice has limited his remarks to the mere colour of the hairs, without entering into those details which in the present advanced state of Zoology, are indispensable to a proper acquaintance with the subject. From his description it is impossible to discover to which of the subgenera of the Linnæan *Ursus* the present species should be referred, which is so entirely new with respect to geographical distribution, that doubts will naturally be excited whether it is not also novel in form. The somewhat projecting upper lip, which may be observed in the figure, appears to connect it with the *Prochilus* of Illiger, and with the *Helarctos* of Dr. Horsfield, described in our last number. We trust that M. F. Cuvier will hereafter develope its scientific characters, and thus enable us, possessing as we now do Bears from almost every quarter, to fix upon a stable basis the subgenera of this very interesting group.

In describing the Souslik, (*Arctomys Citillus* L.) M. F. Cuvier recurs to the fact of his having established some years since in the *Memoires du Muséum d'Histoire Naturelle*, a genus under the name of *SPERMOPHILUS*, of which the present animal, the *C. guttatus* of Pallas, forms the type. It is intermediate between the Marmots and the *Tamias*, or those species of burrowing Squirrels which are provided with cheek pouches, and feed on seeds. With these latter the *Spermophilus guttatus* agrees in habits, and in the slender proportions of its head, while it approaches the Marmots by the thickness of its general form. With both these groups it coincides in the number of its teeth, and even in their form ; except that the molar teeth are narrower, their first tubercle being very

trifling, and the part which unites the second to the third being more prolonged internally; modifications which though apparently slight, are sufficient to distinguish without any difficulty these teeth from all others.

At the period of proposing this genus, and even at that of describing the *S. guttatus*, M. F. Cuvier was acquainted with only this species. He suspected indeed that several American animals hitherto described as Marmots, would eventually prove to be *Spermophili*, but it was not until after publishing the *Souslik* that he was enabled, from actual observation, to establish this fact with respect to one species at least, the *Sciurus tredecim-lineatus* of Dr. Mitchell and *Arctomys Hoodii* of Mr. Sabine. The location of this species in the genera *Sciurus* and *Arctomys* respectively affords a strong *prima facie* presumption of its osculant position between them, which is confirmed by its habits, and finally proved by actual examination.

Such are the principal features of the present numbers of this valuable publication; but there are yet a few others to which we shall cursorily advert. For the Coendou, *Hystrix prehensilis*, L. M. F. Cuvier proposes to employ the generic name of *Sinetherus*, instead of the common appellation which was used for that purpose by Lacepede upwards of twenty years since; an alteration which appears to be quite unnecessary. Another alteration is proposed in the name *Aotus*, used to designate a genus of American Monkeys, by Humboldt. This name being inapplicable to all the species, some of which possess very visible ears, M. F. Cuvier would prefer that of *Nocthora*. The same fact had however been previously observed by M. Spix, and the appellation of *Nyctipithecus*, given by him, has the advantage of priority. The *Aperea*, the animal that constitutes the stock from whence the Guinea Pigs are derived, is distinguished by the new generic name of *Kerodonta*.

M. F. Cuvier regards the dismemberment of the genus *Phalangista*, adopted by M. Temminck, in his *Monographies de Mammalogie*, as founded on erroneous principles. The modification of the organs of motion by the presence or absence of a flying membrane, is merely a secondary character, and consequently

insufficient to constitute a generic distinction. It is however divisible into two genera, corresponding with the two systems of dentition which it presents, and which agree with the two different structures of their crania. In each of these genera there are flying, and not flying, species. To the Phalangers with compound teeth he gives the generic name of *Petaurus*, reserving that of *Phalangista* for those the teeth of which are simple; but as he proposes at a future period to enter into more detail on the subject, we shall defer our further notice, merely remarking that the *P. Cookii*, in the description of which these observations occur, is a *Petaurus* of M. F. Cuvier.

Memoires du Muséum d'Histoire Naturelle. — Sixieme Année.
Cahiers. vi.—x.

OF the zoological contents of the present portions of the Memoirs of the Museum of Natural History, which consist of papers from the pens of MM. Geoffroy Saint-Hilaire, Isidore Geoffroy Saint-Hilaire, and Duponchel, there is much which is incapable of analysis. Of this description is the exposition by the former of these Zoologists of his theory with respect to the opercular or auricular fin of fishes; a theory which in a subsequent number he is under the necessity of defending from the attack on it by M. Cuvier in the *Ossemens Fossiles*. Connected as it is with his peculiar views of the structure and composition of the Cranium, it is impossible to convey a correct idea of it without entering into much greater detail than our space will permit. For the same reason we must also pass by the researches of this philosophic Naturalist “on the organization of the Gavials,” (the *Crocodyli longirostres* of the *Ossemens Fossiles*,) “on their natural affinities, from which results the necessity of a new generic distribution, *Gavialis*, *Teleosaurus*, and *Steneosaurus*; and on the question, whether the Gavials now found in the eastern parts of Asia descend by a series of uninterrupted generations from the antediluvian Gavials, either from the fossile Gavials termed *Crocodyles* of Caen (*TELEOSAURUS*), or from the fossile Gavials of

Havre and of Honfleur, (*STENEOSAURUS*).” The solution of this question is not given; but as far as we can collect, M. Geoffroy Saint-Hilaire is inclined to consider that the living Crocodiles are actually the descendants of those whose remains are now found only in the fossil state, notwithstanding their distinction by such characters as are sufficient on his principles to point them out as generically different. Another extremely curious idea incidentally adduced is that of the affinity of the Crocodile to the *Mammalia*, which is so close as to make it appear to the author of this memoir an amalgam of a Saurian and a Mammiferous Animal. This affinity, which is deduced from the division of the nasal cavity, the *canal cranio-respiratoire*, into two spaces, the upper being destined to the olfactory organs, and the lower to the conveyance of air to and from the lungs, is especially remarkable between the *Gavial* and the *Tamanoir*, (*Myrmecophaga jubata*). Of the genus *Steneosaurus*, which by the bye ought rather to have been *Stenosaurus*, two species are noticed by the extremely awkward trivial names of *S. rostro-major*, and *S. rostro-minor*.

A third paper by the same author, consists of an interesting anecdote of a Beaver from the Rhône which was confined in the Jardin du Roi. To guard him from frost during the winter only an additional portion of litter was allowed him. It happened one night that the cold became very intense; the door of the cage closed badly, and the animal felt it necessary to endeavour to preserve himself from the rigour of the atmosphere. To occupy him during the night and supply him with employment for his gnawing propensity, a certain quantity of fresh branches were regularly put into his cage, together with his food, consisting of legumes and fruits. It had snowed, and the snow had collected in one corner. Such were the materials in the possession of the Beaver, and these he applied to the construction of a wall to defend him from the external air and the frost. He interwove the branches between the bars of his cage, in precisely the same manner as a basket maker would have done. In the intervals left between them he placed all that remained, his carrots, his apples, and his litter, cutting each in such a manner as to fit them to the spaces they were to occupy. To fill up even the chinks

he covered the whole with snow, and in this manner constructed a wall which occupied two thirds of the door-way. During the night the snow was frozen, and in the morning the results of the Beaver's labours were discovered, the animal having deprived itself of its customary food for the purpose of procuring itself shelter against the inclemency of the weather.

The Memoir of M. Isidore Geoffroy Saint-Hilaire is, "On Female Pheasants possessing the plumage of Males." He recalls the fact noticed by Vicq d'Azyr and Mauduit, of the aged female of the common Pheasant (*Phasianus Colchicus*,) acquiring occasionally a plumage differing from that of the male only in its colours being less vivid; and then proceeds to detail two instances of a similar kind which have fallen under his own observation. In the first of these a female of the common Pheasant ceased laying eggs at the age of five years. From that period her plumage began to change, at first on the abdomen, which became more yellow, and on the throat, the colours of which were more vivid, and shortly after on the whole of the body. In the following year the tints of the plumage assumed still more the brilliancy of that of the male; and these became so decided in the third year that it was almost impossible, by the mere inspection of its colours, not to be mistaken in its sex. Her habits changed with her plumage; she became careless of the society of the males, to whom she was equally an object of indifference. At this epoch she died. In the second instance the resemblance became still more complete. A female of the *Phasianus nycthemerus* had ceased laying for three or four years, and had reached the age of eight or ten, when a mixture of white feathers among the usual brownish ones announced the commencement of the change of her plumage to the colours of the male. This change became more strongly marked in the next year, and in the third year it was complete. In the fourth, she assumed entirely the appearance of the male, the crest and tail becoming elongated, and the change thus affecting not merely the colours, but also the relative proportions of the feathers. In the fifth year the resemblance might be termed identical; she represented a male in his most brilliant state of plumage. Shortly after this period she

was killed lest the beauty of her appearance should be impaired by disease or age. Her skin was preserved, and it is now exhibited in the Galleries of the Muséum d'Histoire Naturelle. The absence of the spurs, and the less degree of development of the red circum-orbital membrane, are the only circumstances which indicate externally its real sex.

The production of M. Duponchel is a "Monograph," or rather "Species," "of the Genus *Erotylus*," of which we could not avail ourselves otherwise than by transferring it entire to our pages. Some idea may be formed of the industry displayed in it by the number of new species described, which exceed in the proportion of nearly four to one those noticed by previous authors which have fallen under his observation. The total number of species which he has characterized from the collections of the Museum, and of MM. Latreille and Dejean is ninety, eighty-six of these being figured in three plates. As a supplement he adds from the works in which they are noticed, the characters and descriptions of twenty-four other species which he has not been enabled to see. Of these many are, however, referable to other genera, to *Doryphora*, *Helops*, &c. and are consequently no longer to be enumerated among the *Erotyli*. Several of the true *Erotyli* contained in this latter list exist in the London Cabinets, from which source other still undescribed species might be added to those of M. Duponchel, who will, we trust, be speedily induced to illustrate other genera of *Coleoptera* in the same able manner, in which he has performed this, which we believe to be his first entomological undertaking.

Familles Naturelles du Regne Animal, exposées succinctement et dans une ordre Analytique, avec l'indication de leur Genres. Par M. LATREILLE, Membre de l'Institut, &c. Paris. 8vo. pp. 570.

WHEN noticing in our last number the arrangement of Mollusca proposed by M. Latreille we adverted briefly to the circumstances which had rendered it necessary for that excellent

entomologist to extend his enquiries into other departments of the animal kingdom. Since the misfortune which has incapacitated the venerable Lamarck from continuing his Lectures on the Invertebrated Animals at the Jardin des Plantes, the duty of delivering them has devolved on M. Latreille, who has consequently been compelled to acquire a more general acquaintance with the whole of this grand section of animated nature; to the insect tribes of which his attention had been previously almost exclusively directed. In doing this, he has been induced to go beyond the limits prescribed by mere necessity, and to obtain some knowledge of the *Vertebrata*; and the present work is given to the public as the result of these studies, to which he was prompted by inclination as well as duty. It is, as he justly describes it, "a kind of prodromus, or general programme of Zoology, conducting by degrees and in an analytical manner to groups composed of a small number of genera, the names of which are given; these groups being rather less extensive than the genera of Linné."

In the formation of these groups M. Latreille has been generally successful. That he has not been equally so in another branch of his undertaking, "the attempt to connect them with each other by natural affinities," cannot be matter of surprise, when, notwithstanding the vast extent of our collections, their insufficiency for such a purpose is daily evinced by the additional knowledge of new forms which continues to pour in upon us from all quarters. Nor in fact, even if the materials which we possess were amply sufficient, could they be rendered available to this object, unless displayed upon a general and connected system, adhered to and illustrated throughout the whole of the animal kingdom, and capable of being laid before the observer in a tabular form. No such system is here pursued: on the contrary, so countless is the number of diverging branches spreading out on either side of the principal series which are exhibited, that our minds revolt from regarding them as part of Nature's plan; unless indeed Nature be as bad an architect as those of the days of Elizabeth, and take especial delight in the construction of "galleries that lead to nothing."

Founded as these "Natural Families of the Animal Kingdom" are on the labours of all his predecessors, it would have been impossible for a naturalist of far inferior sagacity to M. Latreille to have combined them together without exhibiting some novelty in the arrangement of so extensive a subject. It is therefore unnecessary to observe that the present work is consequently novel in numerous particulars. These we shall not attempt to point out, as the arrangement of the *Mollusca* noticed before will furnish the reader with a specimen of the mode in which they are produced. From that he will collect, that, with some really new views, there is yet more of the appearance than of the essence of novelty; an appearance which is considerably increased by the continual introduction of new names to designate divisions long since established and defined. Of this the very first step furnishes a striking example. The animal kingdom is divided into three primary series; 1st. the Spini-Cerebraux, being the *Vertebrata*; 2nd, the Cephalidiens, corresponding with the Animaux sans vertebres sensibles of Lamarck; and 3rd, the Acéphales, or Animaux Apathiques of the Zoologist last quoted. That the distinctive characters indicated by these names are of primary importance it impossible to deny; but the propriety of thus affixing new names to old divisions may be well doubted. If this plan were frequently pursued, even the first steps of the science would be so continually shifting as to give an appearance of instability to the whole; for there are few things more attractive to an ambitious mind than to take possession of a place by the side of the masters of Zoology, when it may be acquired at so easy a price as the mere picking out from a lexicon or a dictionary of a few new words.

There is yet another character in which M. Latreille's work is presented to the public; as a "systematic Index to the Dictionaries of Natural History." In this respect it will not be without its use, though inferior in its plan to the "Tableaux Methodiques," of the various classes of animals, contained in the last volume of the 1802 edition of the "Nouveau Dictionnaire d'Histoire Naturelle." The addition in these tables of the characters to the names of the genera considerably increases their utility; but

from this addition M. Latreille has been deterred by the fear of enlarging his publication to too great an extent. His object appears to have been to produce only a single volume as a kind of manual, analogous in some measure to the "Extrait du Cours" of Lamarck, but extending over the whole of the animal kingdom. As this latter was subsequently improved and enlarged by its able author into the "Système des Animaux sans Vertèbres," we trust that the "Familles Naturelles" of M. Latreille is merely a forerunner of a general work, in which, in imitation of his predecessor, he will dilate on those subjects especially for which his previous studies have peculiarly qualified him.

Monograph of the Genus Eucnemis; by the Baron de MANNERHEIM. With Observations by M. LATREILLE.†*

FEW works on a particular subject are capable of vying with the present, either in its descriptive part, or in the execution of the plates and of the typography, which proves to us that St. Petersburg possesses artists of equal ability with those of Paris and of London. In his preface, the author passes in review the several changes which have been effected in the genus *Elatér* of Linné, of which *Eucnemis* formed a part; but although he appears to be well acquainted with the works on this subject, he is mistaken in attributing to Fabricius the establishment of the genus *Melasis*. Of this group the characters were first given by Olivier, in the second volume of his Entomology, and Fabricius subsequently adopted it in his Entomologia Systematica. The genus *Eucnemis* was instituted by M. Ahrens from characters derived from a single species, *capucinus*, which has however been since ranked among the *Elaters*, and even under different trivial names.

This insect appears to form the transition from the preceding genus to those of *Melasis* and *Throscus*, but it presents peculiar

* *Eucnemis insectorum genus monographice tractatum, iconibusque illustratum*, a C. G. libero Barone de Mannerheim. Petropoli, 1823. 8vo.

† Extracted from the *Annales des Sciences Naturelles*.

characters which are developed by Baron Mannerheim with considerable detail. Nevertheless when these are compared with accuracy with those of the *Elaters*, it is difficult to conceive in a sufficiently clear manner, in what respects the two genera essentially differ from each other. This arises from the author of the Monograph having associated with the *Eucnemides*, other insects which do not appertain to this genus, which ought to have been confined to his second section, omitting also the species of its third subdivision, the *E. Filum* and *nigriceps*. Thus modified, and restricted within its proper limits, the genus *Eucnemis* will form a group well distinguished from the neighbouring ones by the following characters; *Tarsi* with entire joints; *hanches* (*laminæ pectorales posticæ*, Mann. *meriaia*, Knoch) of the two posterior legs closing almost entirely the hinder part of the cavity of the thorax, (metathorax,) fixed, forming triangular plates, capable of completely hiding the thighs; *antennæ* approximated at their base, and lodged on each side in a groove hollowed out immediately under the lateral margins of the thorax; *labrum and mandibles* entirely hidden during repose by the anterior extremity of the sternum, prothorax, epistome or clypeus then applied over it, enlarged and transverse in front.

In the *Eucnemis Filum*, the antennæ are always free and uncovered. In other respects it coincides with the characters of the other *Eucnemides*; but on account of this difference, it must form a new genus under the name of *Cryptostoma*. All these groups cannot however be well established without a general revision of that from which they are derived, the genus *Elater*.

Systematische Beschreibung der bekannten Europäischen Zweiflügeligen Insekten, &c. — Systematic Description of the known Dipterous Insects of Europe. By J. W. MEIGEN, Secretary of the Chamber of Commerce at Stolberg, &c. Vol. iv. 8vo. pp. 428. Plates ix.

THE study of the *Diptera*, to which less attention perhaps has been paid than to any other order of Insects, is receiving from

the able author of this excellent work, an impulse which is likely to rescue it from the comparative neglect which it has hitherto experienced. Few, even among Entomologists, were probably aware, before the commencement of M. Meigen's publication, of the vast numerical extent of this order, which appears to be little inferior to that of the *Coleoptera*, the *Lepidoptera*, or the *Hymenoptera*. Before any of these it will now rank in point of facility of discovering and naming the species which may be collected; for none of them has yet found a historian so zealous and persevering as M. Meigen, in the description of those insects to which he has especially devoted himself. Some idea of the number of species already described by him may be obtained from those contained in the present volume, which amount to upwards of six hundred. In their arrangement he introduces many new genera, the characters of which are admirably developed, but for these we must refer to the work itself, in which types of every genus are figured, together with dissections of them, and with examples of each of the sections into which it is necessary to divide the more extensive of them. In the genus *Tachina* for instance, of which no less than three hundred and fifteen species are described, four principal sections are established, which are again divided and subdivided, so as to reduce them into small groups, convenient for the speedy determination of the individuals. The specific characters are given in Latin, the descriptions alone being in the German language.

It is natural to anticipate that with the assistance afforded by this useful production, which will probably be completed in two more volumes, the *Diptera* will form a favourite study of the British Entomologist. In the work of M. Meigen he will find described more than three-fourths of our native species, a proportion far exceeding that of any other order of Insects to be met with in a single publication, or even hitherto perhaps at all published.

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THE
ZOOLOGICAL JOURNAL.

January, 1826.

ART. XLVI. *On the small horny appendage to the upper mandible in very young Chickens.* By WILLIAM YARRELL, Esq. F.L.S.

[To the Conductors of the Zoological Journal.]

GENTLEMEN,

ON mentioning and exhibiting to some friends in the course of a conversation on various ornithological peculiarities, the small horny appendage near the point of the upper mandible in very young chickens, and its use to the animal while confined within the shell of the egg, the subject appeared to them to be worthy of more particular notice. Some works on comparative anatomy were referred to, but without finding any mention of the point in question; I have therefore ventured to make the present communication, and if to your maturer judgment and more extensive reading, it should appear to deserve recording, the insertion of it in your valuable Journal will be esteemed a favour.

The changes the egg undergoes during incubation, chemical as well as organic, the origin of the bone, and the gradual development of the various important parts, are subjects that might naturally be expected to engage the attention and observation of the most eminent anatomists, and I cannot do better than refer the reader to the papers of Sir Everard Home and Dr. Prout, published in the Philosophical Transactions for the year 1822, part ii. (illustrated as the former account is by a series of en-

gravings) as the most recent and complete statements of this interesting and beautiful part of physiology.

It is not upon any of these particulars, already so well detailed, that I am about to presume to offer any observations, but to point out a small horny appendage near the end of the upper mandible of the chicken, and describe its particular use while the young bird remains confined within the shell of the egg; which although not overlooked, has probably been considered of little consequence compared with more important objects of investigation, but is yet adapted to perform a very necessary part; and remains as far as I am acquainted at least, unnoticed in print.

The yolk of the egg is suspended within the white by its chalazas or poles, which not being inserted in the line of its axis, the larger portion of the yolk gravitates, and the cicatricula or molecule destined to become the chick being placed on the surface of the smaller portion of the yolk, will always be found uppermost whatever may be the position of the egg. That this peculiar arrangement leads to important results will be hereafter shewn, and I hope to be excused inserting here one note from the paper by Dr. Prout, in the *Philosophical Transactions* before quoted, from its immediate reference to this point.

“An interesting circumstance may be here mentioned, which I have never seen noticed by any writer on the present subject. At the end of the process of incubation, and for some time before, the animal is so situated in the egg, as, by its superior weight on one side to assume such a position that the beak shall be uppermost, and consequently fully exposed to the air when it first makes its way through the shell.”

During the exhibition of Mr. Barlow's ingenious apparatus for hatching chickens by steam, I had daily opportunities of observing the changes that take place in the egg;* but I shall pass over these, and advance to the seventeenth day, during which, pro-

* The most curious part of this apparatus appeared to be the construction and adaptation of thermometrical levers, which, influenced by the internal degree of temperature, and acting upon certain valves, admitted or excluded atmospheric influence, by which the heat within the machine was kept constantly ranging within four or five degrees of the standard required.

vided the proper degree of heat has been uniformly applied, the first perforation in the egg-shell is sometimes seen, and this is made by the chick itself.

To shew the manner in which this fracture of the shell is effected, I must refer to plate 40, figure 1, of the Philosophical Transactions for the year 1822, as affording an illustration of the particular position of the chicken in the egg. To describe this position it may be stated, that the legs are drawn upwards, the neck bent forwards and downwards, the occipital portion of the head being turned to the left, and pressed at the same time downwards and inwards, the beak will thus be turned upwards and outwards. Upon the curved part of the upper mandible of the chicken, just above the point, there will be seen a small horny scale, nearly circular, having at its centre a hard and sharp projecting point, and by the particular position of the head thus referred to and described it will be found, that this sharp point is brought into constant contact with the inner surface of the shell.

On the eighteenth day the voice of the chick may be heard, and motions producing certain changes of position are also evident from additional perforations in the shell.

The form of the young bird being of greater length than width, little alteration takes place in its longitudinal situation, but partly by the act of the hen in occasionally changing the position of the egg as to its upper surface, (which was also obliged to be attended to with those eggs placed in the hatching apparatus) and partly by the efforts of the young bird, its lateral situation is so changed, that this sharp prominence becomes opposed to the shell at various points in a line extending throughout its whole circumference, about one third below the larger end of the egg; and a series of perforations more or less numerous are thus effected by the increasing strength of the chick, weakening the shell in a direction opposed to the muscular power of the bird: it is thus ultimately enabled by its own efforts to break the walls of its prison; and these attempts become more effectual from the then brittle state of the shell, owing to the evaporation and absorption of the

moisture,* and the partial separation of the membrane that had lined the interior.

I have observed after the first or second natural perforation, on removing a small part of the shell to obtain a partial sight of the chick, that this hard point at the beak was pressed against the shell or through the orifice by repeated efforts, and any change in the position of the egg produced after a short time a new fracture in the shell, distinct from the former, depending on the altered situation of the bird.

On the twenty-first day this stage of the existence of the young of the Common Fowl is completed, and from the particular position in which it is placed within the shell, it will be evident, its strongest efforts are exerted against each end of the egg: the legs are stretched out downwards, and the head and neck raised, the shell already partially divided, either by separate apertures or in a continued line, opens as it were by a hinge, and the smaller portion is frequently inserted or cupped within the larger.

During the first twenty-four hours after exclusion from the shell, the natural warmth of the hen is all that appears necessary to the perfectly formed bird: the down spread over its body becomes dry, the beak hardens, and the small horny protuberance on the point having performed the important office of dividing the shell, is easily separated by the edge of the thumb nail of the attendant, as the chicken passes by hand from the nest to the coop, or remains to be removed by the chicken itself in its early attempts to pick up food. If examined after the second or third day, a light coloured mark only is perceivable on the spot formerly occupied.

In the young Pigeon this appendage to the beak is large and strong, and as these birds are seldom handled during their first fortnight, and are fed by the insertion of the beak of the parent Pigeon, between the mandibles of the young bird, this horny point remains fixed much longer than in the former instance. I have seen it retained after ten or twelve days.

* Eggs of the common fowl during incubation lose in weight on an average about eight grains per day.

In Ducks and Geese the base of this horny protuberance is very broad, in accordance with the breadth of the bill in this tribe of birds; it also appears to have some relation in size to the thickness of the shell: in a preserved specimen of the young of the Egyptian Goose, taken from an egg within a few days of being hatched, this knob is particularly prominent, hard and sharp.

I have the honour to be,

Gentlemen,

Your obedient servant,

WILLIAM YARRELL.

Ryder Street, St. James's, 17th Oct. 1825.

ART. XLVII. *Mollusca Caribbæana*. By the Rev. LANS-
DOWN GUILDING, B.A. F.L. & G.S. M.W.S., &c.

HAVING found it impossible to draw up a satisfactory systematic arrangement of the animals of this *Subregnum*, until I shall have had opportunities of examining and dissecting specimens of many genera which are but seldom obtained, I shall for the present occupy myself in forwarding to the Conductors of the Zoological Journal, accounts of such new or interesting subjects as I have already met with; intending at a future period to give a tabular view of all our genera.

The same difficulty exists with the

<i>Vertebrata,</i>	}	<i>Caribbæana,</i>
<i>Annulosa,</i>		
and		
<i>Radiata,</i>		

but though no good arrangement can yet be offered, my *Amœnitates Zoologicæ* and *Crustacea Caribæa* will contain from time to time figures and descriptions of such species as will be likely to interest the Zoologist of Europe: at a future day they may appear in a more valuable form in a *Fauna* of the West Indies.

I have commenced for the Journal the following essays ;

1. *Pestes occidentales* containing the $\left. \begin{array}{l} \textit{Vertebrata}, \\ \textit{Mollusca}, \\ \textit{Annulosa}, \\ \text{and} \\ \textit{Radiata}, \end{array} \right\} \textit{Noxia} :$

in which figures and descriptions will be given of every animal of the West Indies, which exercises its destructive agency in attacking the person or the property of man.

2. *Miracula Zoologica* containing the $\left. \begin{array}{l} \textit{Vertebrata}, \\ \textit{Mollusca}, \\ \textit{Annulosa}, \\ \text{and} \\ \textit{Radiata}, \end{array} \right\} \textit{Miranda} :$

in which those species will be noticed which offer any thing highly remarkable or uncommon in their structure and economy.

3. *Usus animalium* containing the $\left. \begin{array}{l} \textit{Vertebrata}, \\ \textit{Mollusca}, \\ \textit{Annulosa}, \\ \text{and} \\ \textit{Radiata}, \end{array} \right\} \textit{Pretiosa} :$

or those which contribute directly or indirectly to our food and comforts.

These essays must be extended to a considerable length, and will form in the annulose animals, a long commentary on that unrivalled work, for which we are indebted to the industry and talents of Kirby and Spence. Had I deferred for a few years the publication of these papers, I might have been enabled to present them in a better dress, arranged according to the most modern systems ; but I shall perhaps render a greater service to Natural History, by hastening to publish the most interesting of our animal productions in detached portions, to which a tabular view with additional remarks may be added hereafter.

Such is the task I have chalked out for myself, one which will require for its elucidation many hundred drawings, with their necessary magnified details. All these I shall cheerfully prepare, should not the engraving and colouring of so many subjects en-

tail too great an expense upon the Conductors of this admirable Journal. The late addition of Supplementary Plates is a step which every one must highly applaud, and which will tend to render the work of the greatest possible service to the cause in which we are engaged.

I may here be permitted to notice a remark in the first volume of the Journal, page 563, on my distribution of the genus *Onchidium*. It is too true that the arrangement of the learned Dr. Blainville has never reached my place of exile, and that I have in this, as in many other instances been deprived of the advantages of gleaning from the labours of other men, by the vast distance by which I am separated from more civilized Europe, and all intercourse with the sciences. How many allowances should be made for the Naturalist doomed to reside a thousand leagues from every place of learning, where no works can ever reach him, but such as a moderate income can procure, to satisfy his thirst for information! I must here request that, with the exception of the drawings, every thing I may send to England on subjects of Natural History, may be examined with the greatest caution and suspicion. It must be remembered that without any fellow-labourer to guide or to instruct innumerable errors may occur.

I cannot agree with the Conductors of the Journal, in the manner in which they would distribute the *Onchidia*. There can be no doubt that the generic term must, in our advanced knowledge of these animals, be restricted to those species which most nearly resemble in their economy and structure, *O. Typha*, the type of this curious genus, and which with *O. Sloanii*, and *O. occidentale* is not known to approach the water. "Semi-aquatic, fresh-water, or maritime species," it will doubtless be found necessary to place under other genera.

St. Vincent's, October 24th, 1825.

No. 1. THE AMENDED GENERIC CHARACTERS OF BULIMUS AND
SUCCINEA, &c.

GASTEROPODA.

PULMONIFERA.

HELICIDÆ.

BULIMUS.

Bulimus, Scopoli, Bruguières, Lamarck, Cuvier, Swainson, &c.

Bulla, Martini.

Helix, Lin.

Character Genericus.

Animal terrestre, trachelipodum, oviparum, hermaphroditicum.
Caput declive, in brachia duo semi-retractilia, os tegentia, infernè
expansum.

Os rotundatum, contractile, maximum, *labiis* papillois, *mandi-
bulis* validis, corneis.

Tentacula quatuor, retractilia; duo superiora longiora. *Capi-
tulis* oculigeris.

Operculum nullum.

Pes compressus latissimus, ad *cervicis* elongatæ basin.

Pallium latum, tenue, labra repentis Bulimi lambens, *fora-
mine* communi perforatum.

Penis retractilis, antrum ad radicis tentaculi majoris dextri.

Abdomen spirale, musculo testæ leviter affixum.

Testa ovalis vel oblongo-ovalis, spirâ elevatâ, anfractu ultimo
maximo.

Apertura integra, subovalis, longitudinalis.

Columella lævis, sub-umbilicata, ultra medium inconspicuè
cavo-inflexa.

Labium externum (adulti) crassum, reflexum.

BULIMUS HÆMASTOMUS.

B. olivaceo-niger, corpore corrugato, brachiis latissimis palmatis,
crenato-lobatis, pede subtus pallioque flavescente-sordidis:
tentaculorum superiorum capitulis obtusatis.

Testa ovato-oblonga, ventricosa, subperforata, sordidè albido-flavescens; aufractibus sex obliquè plicatis,* labro columellâque † roseis.

Long. 3 un. 9 lin.—4 un. 3 lin.

Exempla juniora diu tenera subdiaphana, epidermide fuscâ: mox maturescentia epidermide paulatim remotâ pallescunt.

Ova prægrandia, nivea, ovali-elliptica; crustâ corrosâ, calcareâ durâ; vitello vitreo; long. 13. lin., lat. 9 lin. Animal excluditur testâ jam formatâ.‡

Bulimus hæmastomus.—*Lam.* Syst. des Anim. sans vert. 91.

Hist. Nat. des Anim. sans vert 6. 2. p. 117. n. 2.

Leach, Zool. Misc. p. 67. 68. t. 29.

Guilding in Act. Soc. Lin. tom. 14. 2. p. 342.

Scopoli, Delic. insubr. t. 25. f. 1. 2. 6.

Bulimus oblongus.—*Brug.* Enc. art. Vers. No. 34.

Bulimus roseus.—*De Montfort* Conch. Syst. t. 2. p. 259.

Helix oblonga.—*Mull.* Ver. p. 86. n. 284.

Lister, Conch. t. 23. f. 21. Cum ovo pulloque: malè.

Seba, Mus. 3. t. 71. f. 17—20.

D' Aud. Hist. des Moll. No. 411.

Born, Mus. t. 15. f. 21. 22.

Favanne, Conch. t. 65. f. 1¹.

Gmel. p. 3637. No. 87. ejusdem Turbo hæmastomus, p. 3597. No. 38.

Bulla oblonga.—*Chem.* Conch. 9. t. 119. f. 1022. 1023.

Habitat in Antillarum, et Americæ æquinoctialis dumetis; satis frequens.

* It is necessary to make a distinction between *Striæ* engraved on the surface, and mere *Plicæ* or *Rugæ*.

† A protuberance is sometimes to be seen on the columella above the umbilicus, in old shells.

‡ Contrary to the opinion maintained by that able Comparative Anatomist Sir E. Home, in the Philosophical Transactions for the year 1817.

SUCCINEA.*

Succinea. *Draparnaud, Cuvier, Lam. Sowerby, Guilding.*

Character Genericus.

Tentacula quatuor retractilia, duo superiora elongato-cylindrica, capitulis oculiferis.†

Pallium latum, pedem retractum tegens.

Pes magnus, postice attenuatus.

Operculum nullum.

Animal terrestre, vix intra testam recipiendum.

Testa ovata vel ovato-conica, *aperturâ* amplissimâ integrâ, sæpius longitudinali; *labio* externo tenui, non reflexo.

* Were it not likely to add confusion to our delightful science, this name might well be changed: such generic terms as *Succinea* in Zoology, and *Laccodon* in cryptogamic Botany cannot be too severely censured.

† Notwithstanding the curious remarks of M. Gaspard, in the second Number of this Journal, p. 179, I think we may persist in calling the spots on the superior *tentacula*, the eyes; though they are without doubt very imperfectly developed. These organs, situated at the very base of the feelers of *Limnæa*,* *Helicina*, and other genera, cannot surely be considered as "organs of touch." In some marine *Mollusca* their structure is much more perfect.

* I take this opportunity of calling the attention of British Naturalists to the vast number of amphibious *Mollusca*, which swarm in the ditches and rivulets about Oxford, the shells only of which have been figured even in modern works. I unfortunately neglected during my residence at the University to draw and describe the animals; but should any one out of the *small* number of our members, who have had opportunities of attending to such studies undertake the task, his industry would doubtless be rewarded, by the discovery of many new and interesting species. I say "small number," but we may trust that the stigma we have so long borne for our neglect of Zoology, will soon be wiped away, and that the time is not far distant, when his Majesty in his paternal anxiety for the credit of the University, will found a Professorship of Zoology; as he has done already in Geology and Mineralogy, placing it in this particular, in which alone it seems deficient, on a footing with those of the continent. Then may we hope to see the names of our Ashmole, and the laborious Lister held in respect by those to whom they bequeathed their treasures; and the miserable remains of their once valuable museum, placed under the care of some one possessing the diligence and ardour of Buckland, and arranged in a manner calculated to instruct and not to disgust the Student in Zoology.

Columellâ lævi, angustâ, attenuato-acutâ, in peritrema sensim exeunte. Anfractu basilari maximo.

SUCCINEA CUVIERII.

S. corpore flavido-fuscescente, nigro lineato-maculato, oculis aterrimis.

Testa nitens, diaphana, pallidè succinea, immaculata, obliquè plicata, anfractibus duobus superioribus obsoletioribus.

Habitat in umbrosis Sti. Vincentii sub lapidibus. Instante pluvîâ ante solis æstus in dumetis cibum quærit.

Juniores sæpe testam vestitu quasi stercoreato tegunt, et sic hostes, etiam zoologicoſ, arte mirâ decipiunt.

Huic speciei novæ det nomen illustrissimus Cuvierius (summus Galliæ), summus Europæ Zoologus.

No. 2. AN ACCOUNT OF A NEW GENUS OF MOLLUSCA.

Subregnum *Mollusca* hocce genere paradoxico multum perturbatur. Vermis moribus onchidio* terrestri similis, at (quod admirabile) polypus. Genus incertæ sedis classem propriam, gastrostomodis affinem reposit, quæ pedibus multis lateralibus distinguitur.

* Genus *Limacidarum* novum (cui nomen *Herpa*) sic nuper descripsi.

Char. gen. Corpus elongatum, repens, complanatum, anticè præsertim attenuatum, subtus planum, pede distincto nullo.

Tentacula nulla. Brachia minuta duo? Os anticum subrotundatum supra. Oculi utrinque tres, minimi, in triangulum dispositi. Anus prope caudam infra. Glandulæ ventrales plurimæ, unicâ maximâ. Foramen pulmonali? ad dextrum latus.

Unica species mihi nota (*H. limacina*). Hab. inter gramina St. Vincentii.

Fortè *Planaria terrestris* et *candida* Gmel. quas non vidimus, ad hocce genus referendæ. Dies docebit.

Subreg. MOLLUSCA.

Classis. POLYPODA. Guild.

Genus. PERIPATUS.*

Character Genericus.

Corpus molle, elongatum, contractile, subrotundatum, posticè subattenuatum, corrugatum.

Tentacula duo longa, semi-retractilia, sub-cylindracea.

Os subtus longitudinale, (in quiescente) clausum; *labiis* (dum extenditur) papillosis.

Mandibulæ nullæ.

Oculi ad radices tentaculorum, obscuri, verrucosi.

Clypeus nullus.

Anus posticus, infra.

Orificium generationis? distinctum, posticum, infra.

Ambulacra utrinque 33, paribus alternis extenduntur.

Ungues multifidi.

PERIPATUS JULIFORMIS.

P. atro-fuscus, annulosè flavido maculatus: ventri nigrescente-roseo; corpore toto spinuloso-papilloso; lineâ dorsali atrâ.

Long. corp. 3 un. Lat. 3 lin.

Habitat in sylvis antiquis Sti. Vincentii sæpe retrogradus. Atteritus liquorem glutinosum ab ore respuit. Inter plantas a me lectas ad radices montis immensi "Bon Homme" unicum exemplum attonitus fortè detexi.

Explicatio Tabulæ XIV^e.

F. 1. Animal quiescens auctum. *a* Anus. *b* Orificium generationis? *c* Oculus. *d* Pes auctus.

F. 2. Caput auctum, labiis expansis et antennis truncatis.
a Labii papillus.

* Nomen a *περίπατος*, ambulacrum.

ART. XLVIII. *On the Stirpes and Genera composing the Family Pselaphidæ; with Descriptions of some new Species.* By WILLIAM ELFORD LEACH, M.D. F.R.S. &c.*

STIRPS I.

Corpus elongatum, depressum. Antennæ undecim-articulatæ.
Palpi maxillares valdè elongati.

GENUS I. EUPLECTUS.

EUPLECTUS, KIRBY, LEACH.

CORPUS elongatum, depressum.

Antennæ undecim-articulatæ, articulis primo et secundo aliis multò crassioribus.

Palpi maxillares valdè elongati; articulo ultimo conico.

BODY elongate, depressed.

Antennæ eleven-jointed; their first and second joints much thicker than the others.

Maxillary palpi very much elongated; their last joint conical.

EUPLECTUS EASTERBROOKIANUS.

E. corpore toto intensè ferrugineo; antennis palpis pedibusque pallidioribus; thorace ruguloso; elytris punctulatis.

Habitat in Danmoniæ Nemoribus rarissimus.

Mus. Dom. Easterbrook.

E. with the whole of the body dark ferruginous; the antennæ, palpi, and feet paler; the thorax rugulose; the elytra punctulated.

This new species was discovered last spring in a grove near Ashburton by Mr. G. Easterbrook, who found the male and female in copulation; these are the only specimens hithertò found.

* Communicated by the Author.

Pselaphus nanus, Reichenbach, Monographia Pselaphorum, 69, and two other species in my collection of insects now in the British Museum, are the only species that I know certainly to belong to this genus; but I think it probable that *Pselaphus ambiguus*, *Karstenii*, and *signatus* of Reichenbach may also belong to it.

STIRPS II.

Corpus breve, convexum. Antennæ undecim-articulatæ. Palpi maxillares elongati.

GENUS II. BYTHINUS.

PSELAPHI. FAM. II. REICHENBACH.

CORPUS breve, depressum.

Antennæ articulo primo crasso, cylindræo; secundo primo abruptè crassiore, MARIS internè acutè producto; articulo tertio, quarto, quinto, sexto, septimo et octavo æqualibus, lenticulatis; nono et decimo crassioribus lenticulatis; undecimo ovato, apice acutissimo.

Palpi maxillares articulo primo filiformi apice gradatim clavato; secundo ovato; tertio ovato, scutiformi, maximo; basi angustissimo.

Body short, depressed.

Antennæ with the first joint thick, cylindrical; the second abruptly thicker than the first; the third, fourth, fifth, sixth, seventh, and eighth equal, lenticular; the ninth and the tenth thicker, lenticular; the eleventh ovate with its extremity very acute.

Maxillary palpi with their first joint filiform, gradually clavate (clubbed); the second ovate; the third ovate scutiform (shield-shaped) large, with its base very narrow.

BYTHINUS CURTISIANUS.

B. saturatè badius aut fusco-badius; ore, antennis, pedibusque rufo-castaneis; thorace capite latiore; elytris punctatis.

Bythinus Curtisii. Leach, Zool. Miscell. iii. 83.

Habitat in Norfolciâ anctoritate Domini J. Curtis; apud Bexley propè Londinum ♂ observavit Dominus G. Samouelle.

Mus. nostr. in Mus. Brit. ♂ et ♀.

B. dark-bay or fuscous-bay; the mouth, antennæ, and the feet red-chesnut; the thorax wider than the head; the elytra punctured.

This species was first discovered in Norfolk by Mr. J. Curtis, and at Bexley near London by Mr. G. Samouelle. Both sexes are in my collection in the British Museum.

GENUS III. ARCOPAGUS.

PSELAPHI. FAM. II. REICHENBACH.

CORPUS breve, convexum.

Antennæ articulo primo et secundo aliis crassioribus; articulo primo elongato; secundo subgloboso primo tenuiore; articulis tertio, quarto, quinto, sexto, septimo et octavo æqualibus, subglobosis; nono crassiore, lenticulari-subgloboso; decimo lenticulari-subgloboso præcedente majori; undecimo aliis crassiore, ovato, apice acuminato.

Palpi maxillares articulo primo filiformi, apice gradatim clavato; secundo elongato-ovato; tertio ovato-scutiformi basi angustissimo.

Body short, convex.

Antennæ with the first and second joints thicker than the others; first one elongate; the second subglobose, narrower than the first; the third, fourth, fifth, sixth, seventh, and the eighth equal, subglobose; the ninth thicker, lenticular, inclining slightly to globose; the tenth lenticular, inclining slightly to globose, larger than the preceding one; the eleventh thicker than the others, ovate, acuminate at its extremity.

Maxillary palpi with the first joint filiform, its extremity gradually clavate; the third ovate-scutiform with its base very narrow.

ARCOFAGUS RUGICOLLIS.

- A. "corpore toto castaneo; antennis, palpis, pedibusque pallidioribus; capite punctulato; thorace ruguloso; elytris punctatissimis nitidis."

Arcopagus rugicollis. Tozzelfi mss.

Habitat in Italiæ sylvis profundis.

Mus. Dr. Tozzelfi.

- A. with the body entirely chesnut; the antennæ, palpi, and the feet paler; the head punctulated; the thorax rugose; the elytra shining, and very much punctulated.

Inhabits Italy in dark woods. This description was given me by Professor Tozzelfi. *Pselaphus glabricollis*, Reichenbach, Monographia Pselaphorum, 43. tab. 1. f. 3. is the only other species that I know to belong to this genus excepting this new one.

GENUS IV. KUNZEA.

PSELAPHI. FAM. II. REICHENBACH.

CORPUS breve, convexum.

Antennæ articulo primo et secundo aliis crassioribus; articulo primo elongato-cylindraceo internè in ♂ et ♀ abruptè dilatato; secundo globosiusculo primo tenuiore; articulis tertio, quarto, quinto, sexto, septimo et octavo æqualibus globosiusculis: nono crassiore lenticulari; decimo globosiusculo-lenticulari nono majore; undecimo crassiore, ovato, apice acuminato.

Palpi maxillares articulo primo filiformi, apice gradatim clavato; secundo elongato-ovato, tertio scutiformi, basi angustissimo.

BODY short, convex.

Antennæ with their first and second joints thicker than the others; the first elongato-cylindric, internally in both sexes abruptly dilated; the second minutely globose, narrower than the first one; the third, fourth, fifth, sixth, seventh, and eighth equal, minutely globose; the ninth thicker, lenticular; the tenth minutely globose inclining to lenticular; the eleventh ovate, acuminate at its extremity.

Maxillary palpi with the first joint filiform, its extremity gradually clavate (clubbed); the second elongate-ovate; the third scutiform, with its base very narrow.

KUNZEA NIGRICEPS.

K. corpore toto ferrugineo; antennis palpis pedibusque pallidioribus; capite nigrescente.

Habitat in Alpibus Maritimis in Sylvis pinestribus rarissima.

Mus. Domini Doctoris Fabre ♂ et ♀ in copulatione captâ.

K. with the whole of the body ferruginous; the antennæ, palpi, and the feet paler; the head blackish.

Inhabits the Maritime Alps, in dark pine forests, is extremely rare; two specimens from which this description was taken, were found by Dr. Fabre in copulation; he assured me that he had not seen any other in the collections of his friends or elsewhere.

GENUS V.—TYCHUS.

PSELAPHI. FAM. II. REICHENBACH.

CORPUS breve, convexum.

Antennæ articulis primo et secundo crassioribus subcylindraceis; articulo primo secundo longiore et crassiore; articulis tertio, quarto, quinto, sexto, septimo et octavo subglobosis: articulis primo, tertio et quarto (MALES) præsertim aliis crassioribus; nono et decimo globoso-lenticularis; decimo nono majore; undecimo ovato aliis crassiore apice abruptè acuminato.

Palpi non sedulosè examinavi.

BODY short, convex.

Antennæ with the first and second joints thickest, subcylindrical; the first joint longer and thicker than the second; the third, fourth, fifth, sixth, and seventh subglobose; the first, third, and fourth joints (especially in the MALES) thicker than the others; the ninth and tenth globose inclining to lenticular; the tenth larger than the ninth; the eleventh ovate, thicker than the others, abruptly acuminate at its extremity.

The maxillary palpi I have not carefully examined.

TYCHUS NIGER.

T. Corpore toto nigro; pedibus nigrescentibus; thorace elytrisque punctulatis.

Pselaphus niger. Reichenbach, *Monographia Pselaphorum*. 35. tab. i. fig. 5 ♂ et a ♀.

Tychus niger. Leach, *Zool. Miscell.* iii. 184.

β. niger; Elytris disco castaneis.

Habitat propè Londinum, Bristol et in Provinciâ Norfolciâ haud valde infrequens.

T. with the body entirely black: the feet blackish; the thorax and the elytra punctulated.

β. black, with the disc of the elytra chesnut.

Inhabits the vicinity of London, and Bristol, and is found in Norfolk not unfrequently.

GENUS VI.—BRYAXIS.

PSELAPHI. FAM. III. REICHENBACH.

CORPUS breve, convexum. Thorax foveolis sulco conjunctis sculptus.

Antennæ articulis primo et secundo aliis crassioribus, subcylindraceis; articulis tertio, quarto, sexto, et septimo elongatis, cylindraceis; quinto longiore; octavo subgloboso minore; nono decimo et undecimo elongatis clavem gradatim formantibus; hoc apice acuminato.

Palpi maxillares articulo primo clavato basi angustissimo; secundo subgloboso; tertio conico.

BODY short, convex. Thorax sculptured with foveolæ (little pit-like excavations) joined by a groove.

Antennæ with their first and second joints thicker than the others, subcylindric; the third, fourth, fifth, sixth and the seventh joints elongate, cylindric; the fifth longer; the eighth smaller, subglobose; the ninth, tenth, and the eleventh elongate gradually forming a club; the last one with its apex acuminated.

Maxillary Palpi with the first joint clavate, with its base very narrow; the second subglobose; the third conical.

SPECIES I. *BRYAXIS LONGICORNIS*.

B. Corpore toto ferrugineo ; antennis, palpis, pedibusque pallidioribus ; capite thorace elytrisque glaberrimis, nitidis, punctulis numerosis sculptis.

Bryaxis longicornis. *Leach, Zool. Miscell.* iii. 85.

Habitat in agris *Battersea* dictis propè Londinum, inter Graminum radices haud infrequens.

B. with all the body ferruginous ; the antennæ, palpi, and the feet paler ; the head, thorax, and the elytra very smooth, shining, sculptured with numerous punctules (minute imperfect dots.)

This species is found in the *Battersea* fields, not unfrequently at the roots of grasses.

SPECIES II. *BRYAXIS SANGUINEA*.

B. Corpore toto sanguineo ; antennis, palpis, pedibusque pallidioribus ; capite, thorace, elytrisque glabris, nitidis, punctatis.

Pselaphus sanguineus. *Reich. Monog. Pselaph.* 49.

Bryaxis sanguinea. *Leach, Zool. Miscell.* iii. 85.

Habitat in *Norfolciâ*, et in agris *Battersea* dictis propè Londinum rarior.

B. with all the body blood-red ; the antennæ, palpi, and the feet paler ; the head, thorax, and the elytra smooth ; shining punctulated.

Inhabits *Norfolk* and *Battersea* fields ; it is rather rare.

GENUS VII.—*REICHENBACHIA*.

PSELAPHI. FAM. III. REICHENBACH.

CORPUS breve, convexum. Thorax foveolis distinctis sculptus.

Antennæ articulis primo et secundo aliis crassioribus ; articulis tertio, quarto, quinto, sexto, et septimo æqualibus, brevibus ; octavo paululùm longiore ; nono subgloboso ; decimo lenticulari ; undecimo apice subobtus.

Palpi maxillares articulo primo clavato, basi angustissimo ; secundo subgloboso ; tertio conico.

BODY short, convex. Thorax sculptured with distinct foveolæ, (little pit-like excavations).

Antennæ with their first and second joints thicker than the others; the third, fourth, fifth, sixth and seventh equal, shorter; the eighth a very little longer; the ninth subglobose; the tenth lenticular; the eleventh with its apex rather obtuse.

Maxillary palpi with the first joint clavate, with its base very narrow; the second subglobose; the third conical.

REICHENBACHIA JUNCORUM.

R. rufescente-castanea cinereo pubescens; antennis pedibusque dilutioribus; thorace gibbosiusculâ; foveolis lateralibus majoribus; posticâ minimâ.

Briaxis Juncorum. Leach, *Zool. Miscell.* iii. 86.

Habitat in Angliâ in Juncis. In Norfolciâ, Danmoniâ et propè Londinum observavi.

B. reddish inclining to chesnut, covered with cinereous down; the antennæ and the feet paler; the thorax somewhat gibbous; with the lateral foveolæ largest; the hinder one small.

Inhabits England in Junci. I have observed it in Norfolk, Devonshire, and near London.

The following species, described in Riechenbach's Monograph, belong to this genus—*Pselaphus impressus*, *fossulatus*, and *hæmaticus*.

GENUS VIII.—PSELAPHUS.

PSELAPHUS, HERBST, &c.

PSELAPHI. FAM. I. REICHENBACH.

CORPUS breve, convexum.

Antennæ articulis primo et secundo elongatis, subcylindraceis; articulis tertio, quarto, quinto, sexto, septimo et octavo subglobosis, æqualibus; novo et decimo crassioribus ferè æqualibus subglobosis; undecimo, elongato-ovato aliis crassiore.

Palpi maxillares articulo primo filiformè apice subabruptè clavato; secundo subgloboso; tertio filiformi apice gradatim clavato.

BODY short, convex.

Antennæ with the two first joints elongate, subcylindrical ; the third, fourth, fifth, sixth, seventh and the eighth joints subglobose, almost equal ; the ninth and the tenth thicker, subglobose ; the eleventh elongato-oval thicker than the others.

Maxillary Palpi with their first joint filiform, rather abruptly clavate at its apex ; the second subglobose ; the third filiform, gradually clavate at its apex.

PSELAPHUS NIGRICANS.

“*P. Corpore toto nigrescente ; antennis, palpis, pedibusque dilutioribus.*”

Pselaphus nigricans. *Tozzelfi MSS.*

Habitat in Italiâ propè Ferenzam.

P. with all its body blackish ; the antennæ, palpi, and the feet paler.

Inhabits Italy near Florence.

STIRPS III.

CORPUS subcylindræum. *Antennæ*-sex articulatæ. *Palpi* maxillares brevissimi.

BODY subcylindric. *Antennæ* six-jointed. *Maxillary palpi* very short.

GENUS IX.—CLAVIGER.

CLAVIGER, LATREILLE.

CORPUS subcylindræum.

Antennæ sex-articulatæ, articulis primo et secundo minoribus subglobosis.

Palpi maxillares filiformes.

BODY subcylindric.

Antennæ six-jointed ; the first and second joints smallest, subglose.

Maxillary palpi filiform.

This Genus I have never seen.

ART. XLIX. *Catalogue of the various Birds which at present inhabit or resort to the Farn Islands, with Observations on their habits, &c.* By P. J. SELBY, Esq. F.L.S. M.W.S.

GENTLEMEN,

THE following catalogue of the various species of Birds which at present inhabit or resort to the Farn Islands, for the purpose of incubation, though probably uninteresting to most of the present readers of your Journal, may perhaps be of some value hereafter to the Naturalist; as it will serve to indicate whatever changes may take place, (and such in parallel cases are frequently known to occur,) either by the desertion of some of the present visitants, or the accession of others. I have added a few observations illustrative of the habits and economy of the various species, in order if possible to do away with the tedium of a mere nomenclature; though I fear my remarks will be found to possess little novelty, or that is not already known to most of your readers.

The group of the Farn or Fairn Islands is situated upon the Northern coast of Northumberland, in latitude $55\frac{1}{2}$ N. They are composed of whin trap, a formation which prevails to a considerable extent upon the main land opposite. From the nature of the rock they in general present a rugged and uneven surface, but some of the larger islets are covered with vegetable mould, producing a plentiful crop of *Poa maritima* and *procumbens*, *Silene inflata*, *Statice Armeria*, &c. The inner, or nearest island to the shore is about $2\frac{1}{2}$ miles distant; this, called by way of distinction the greater Farn, attains a considerable elevation, and presents a perpendicular front to the West, of from 35 to 40 feet in height; the outermost is about 8 miles from shore, and the ridge runs in a direction from West to North-east. Light-houses for the security of navigation, at all times dangerous upon this rocky coast, have been erected by the corporation of the Trinity House, upon the nearest, and one of the farthest islands. The property is vested

in the Dean and Chapter of Durham, but leases are granted, renewable from time to time upon payment of a fine. This lease has lately passed into the hands of the society above mentioned, and we indulge the hope that they will afford to the feathered inhabitants that protection which has been withheld for some years past, to the manifest diminution of their numbers. By so doing they will not only entitle themselves to the thanks of the Ornithologist, and such strangers as from curiosity annually visit these islands, but they will eventually render them of more intrinsic value by the great increase of the produce, consisting of feathers, eggs, and eider-down.

Ordo. INSESSORES. Vigors.
Trib. FISSIROSTRES. Cuv.
Fam. HIRUNDINIDÆ. Vigors.
Genus. HIRUNDO. Linn.

Hirundo rustica. Linn. I. 343. Lath. Ind. 2. 272.
Common or Chimney Swallow. Lath. Syst. Penn. &c.

This well-known species breeds in the tower of the old light-house, and in the chimneys attached to the dwellings of the light-keepers.

Trib. DENTIROSTRES. Cuv.
Fam. SYLVIADÆ. Vigors.
Genus. ANTHUS. Bechst.

Anthus aquaticus. Bechst. Naturg. Deut. 3. 745.
Alauda campestris Spinoletta. Lath. Ind. 2. p. 495. sp. 12. B
—— *Petrosa*. Trans. Linn. Soc. 4. p. 41.
—— *Obscura*. Gmel. 1. p. 801. sp. 33. Lath. 2. 494. s. 7.
Rock Lark. Mont. Ornith. Dict.
Rock Pipit. Selby's Illust. Br. Ornith.

This species is met with upon all the Islands, where it is a permanent resident. It breeds in the clefts and upon the shelves of rocks, the nest is composed of the decayed stalks of such grasses as grow here. Marine insects and flies constitute its food.

456 Mr. Selby on the Birds of the Farn Islands.

Its note is very similar to that of *Anthus pratensis*, (Meadow Pipit).

Trib. CONIROSTRES. Cuv.

Fam. CORVIDÆ. Leach.

Genus. CORVUS. Linn.

Corvus Monedula. Linn. et Auct.

Jackdaw. Lath. Penn. &c.

This well known bird breeds in the rabbit holes upon the greater Farn, as well as in the clefts of the perpendicular rocks.

Ordo. GRALLATORES. Ill.

Fam. SCOLOPACIDÆ. Vigors.

Genus. TRINGA. Linn.

Tringa maritima. Brunn. Orn. Boreal. No. 182. Lath. Ind. 2. 731.

—— *nigricans*. Mont. Trans. Linn. Soc. 4. p. 40. t. 2. f. 2.

Purple Sandpiper. Walc. Syn. 2. 155.

Rock *Tringa mihi* ——

A few pairs of this species generally remain, and breed upon some of the Islets. Last season I met with a family, the young of which were scarce able to fly. I have not yet succeeded in obtaining the eggs, which remain undescribed. This bird is strictly confined to rocky coasts, and is never seen in company with those which affect sandy flat shores. The great body of the species retires northwards to breed early in May. It is frequently found associated with the *Strepsilas* (Turnstone). It feeds upon small marine insects, but principally upon very small bivalve and univalve shell fish.

Fam. CHARADRIADÆ. Vigors.

Gen. HÆMATOPUS. Linn.

Hæmatopus ostralegus Linn. 1. 257. Lath. Ind. 2. p. 725.

L'Huiterier. Buff. ois. 8. 119. t. 9.

Pied Oyster Catcher, or Sea Pie. Lath. Syn. Penn, &c.

The Oyster Catcher breeds upon several of the Islands. It makes no nest, but its four eggs are deposited upon the shingle or gravel, to which they assimilate so much in colour, as not to be found without the narrowest search. The old birds shew great anxiety when the nest or young are approached, and fly around the head of the intruder with clamorous outcries. The membranous appendages which border the toes of the *Hæmatopus*, and which connect it by affinity to the lobe-footed members of the *Rallidæ*, enable it to swim with great buoyancy and ease, but it seldom voluntarily resorts to the water, except when wounded, and endeavouring to escape its pursuer, or when feeding in pools left by the tide, and passing from one stone or point of rock to another.

It sits three weeks.

Genus CHARADRIUS. Linn.

Charadrius hiaticula. Linn. 1. 253. Lath. Ind. 2. 743. sp. 8.

Le Pluvier à collier. Buff. ois. 8. p. 90.

Ring Plover. Lath. Syn. 5. 201. Penn. Brit. Zool. p. 129. Mont. &c.

A few pairs breed upon the gravel beds which are met with in the creeks and bays of the Islands. Like most of the *Charadriadæ*, they lay four eggs of a cream colour blotched with black or deep brown.

Ordo. NATATORES. Illig.

Fam. ANATIDÆ. Leach.

Genus. SOMATERIA. Leach.

Somateria mollissima. Leach.

Anas mollissima. Linn. I. 198. Lath. Ind. 2. p. 845. sp. 35.

Oie à duvet ou Eider. Buff. ois. 9. 103.

Eider or Cuthbert Duck. Lath. Syn. 6. 470. Penn. Brit. Zool. 152.

These birds if protected would soon become very numerous, and might be made a source of productive wealth, as they voluntarily afford in great abundance that fine and elastic down known

by their name, and which as an article of luxury produces an exorbitant price. This consideration however has hitherto been lost sight of, and the eggs of the Eider have been taken indiscriminately with those of the Gull, Guillemot, &c. and sold for a mere trifle to the inhabitants of the Main. In consequence, the young annually produced have been few, and those only of the later or second hatchings. The last season however proved more fortunate to all the feathered inhabitants of the Islands, as they were protected from extensive depredation by the gentleman employed as architect to erect another light-house upon one of the exterior and leeward rocks, to replace the one now in use, which is found to be situated too much in the centre of the cluster to answer effectually its intended purpose. A very numerous brood of all the species, but particularly of the Eiders, was the consequence of this care, and as the young are supposed to return with the old birds to the same breeding stations, a few years under similar circumstances would encrease their numbers to a considerable extent. About April the Eiders are seen assembling in groups along the shores of the main land, from whence they cross over to the Islands early in May. As soon as the females begin to lay, which is usually about the 20th, the drakes leave them, and again spread themselves along the adjoining coast. The usual number of eggs is five, of a pale asparagus green, and not much inferior in size to those of a goose. The nest is composed of a few rents or fine sea weed, and as incubation proceeds, a lining of down, plucked by the bird from her own body, is added; this increases from day to day, and at last becomes so considerable in quantity, as to envelope and entirely conceal the eggs from view, no doubt contributing by its effect as a non-conductor of heat to the perfect evolution of the fœtus. The young as soon as hatched are conducted to the water, and this in some instances must be effected by the parent carrying them in her bill, as I have frequently seen the nest placed in such situations as to preclude the possibility of its being done in any other way. Incubation lasts a month. The food of the Eider consists of the young of the different *Mytili* that cover the rocks, and other species of bivalves. They are only to be reared with difficulty in confinement, and

being very bad walkers, are subject to frequent accidents in the poultry yard. Like all the *Anatidæ*, possessing a lobated hind toe, they dive with facility, and remain submerged for a long time.

Fam. ALCADÆ. Vigors.

Genus. URIA. Briss.

Uria Troile. Lath. Ind. 2. p. 796. 1.

Colymbus Troile. Linn. Syst. 1. 220. 2. Gmel. Syst. 1. 585.

——— *minor*. Gmel. 1. 585. sp. 14.

Guillemot a capuchon. Temm. Man. d'ornith. 2. 921.

Foolish Guillemot. Lath. Syn. 6. 329. 1. Penn. Br. Zool. 2. No. 234.

Lesser Guillemot. Penn. Arct. Zool. supp. 69.

A numerous colony of this well known species breeds upon the summits of the Pinnacles, three fine isolated pillars, or masses of rock, detached about 20 yards from Staple Island. They make no nest, but their solitary egg, which is of a peculiar shape, being very narrow and pointed at one end, broad and round at the other, which form prevents it from rolling to any distance, is laid upon the bare rock. Incubation lasts for one month, and the birds, from their conformation, are obliged to sit in an upright position. The young when excluded, are covered with a close down, of a blackish grey above and white below. They remain upon the rocks till fledged, which is in about a month from the time of hatching. The parent birds supply them plentifully with Herring Sprats (*Clupea Sprattus*) the principal food of this as well as other species belonging to the *Alcadæ*. The adults lose the black throat early in autumn, and as well as the young are then known as the *Colymbus minor* or lesser Guillemot of authors.

Genus ALCA. Linn.

Alca torda. Linn. 1. 210. 1. Gmel. Syst. 1. p. 551. Lath. Ind.

2. 793. sp. 5.

Alca Pica. Gmel. Syst. 1. p. 551.

Pingouin macroptère. Temm. Man. d'ornith. 2. 936.

Razor bill Auk. Lath. Syn. 5. 319. British Zool. 2. No. 240. t. 82.

A few of this species annually breed in company with the Guillemots. The eggs of both are so much alike in shape, as to make it very difficult to distinguish them, and they are subject to the same variation in colour and markings. The old birds lose the nuptial plumage about the same time as the Guillemot, and in their winter dress may be recognized as the *Alca Pica* and *A. minor* of authors.

Genus MORMON. Illig.

Mormon fratercula. Temm. Man. d'ornith. 2. 933.

Alca Arctica. Linn. 1. 211. 4. Gmel. 1. 549. Lath. 2. 792.

Fratercula. Briss. 6. 81.

Le Macareux. Buff. ois. 9. 358. t. 26.

Puffin. Lath. Syn. 5. 314. 3. British Zool. 2. No. 232. &c.

This species resorts to the Walmseys, two small Islands which have a covering of vegetable mould, in which they burrow and rear their young. The hole is generally about three feet in length, and runs in a horizontal direction. They lay but one egg, of an oval form, and yellowish white colour, which they sit upon for a month. The young, till fledged, are covered with a long and fine down, of a sooty or brownish black, which gives them a grotesque appearance. The bill in the young bird is but imperfectly developed, being slender and narrow, of a black colour, and scarcely shewing the commencement of the furrows which distinguish the high compressed bill of the adults.

Fam. PELICANIDÆ. Leach.

Genus CARBO. Meyer.

Carbo Cormoranus. Meyer Tasschenb. D.

Phalacrocorax. Briss. 1. 511.

Pelecanus Carbo. Linn. 1. 216. 3. Gmel 1. 573. Lath. 2. 88. sp. 14.

Le Cormoran. Buff. ois. 8. 310. 26.

The Cormorant. Lath. Syn. 6. 593. 13. British Zool. 2. No. 291, &c.

For many years these birds bred upon one of the outer islands, called the Longstone; but having been repeatedly disturbed and deprived of their eggs, they removed this last season to the northern Walnsey. They breed in company, and their nests are frequently close to each other; they are composed of a great mass of sea tangle, and are frequently two feet in height. They lay from four to six eggs, of a small size in proportion to the size of the bird, thickly coated with a rough, white, calcareous deposit. The young, when first excluded, are blind, and covered with a blueish black skin; in the course of a few days they acquire a thick covering of black down, and are sufficiently fledged to take to the water, though still unable to fly, in the space of three weeks or a month.

CARBO CRISTATUS. Temm.

Pelecanus cristatus. Lath. Ind. 2. 888. sp. 16. Gmel. 1. 575.

Crested Shag, or Green Cormorant. Arct. Zool. 583. British Zool. 2. No. 282 t. 102. Lath. Syn. 6. 600. 15.

A few pairs annually breed in the clefts and upon the ledges of the Pinnacles, and the rock opposite to them; their eggs are very like that of the Great Cormorant. The large projecting crest upon the forehead, a distinguishing character of this species, is confined to the breeding season. It was long confounded with the *Carbo Graculus* (Shag) of authors.

Fam. LARIDÆ. Leach.

Genus. STERNA. Linn.

Sterna Arctica. Temm. Man. d'Ornith. b. 2. p. 724.

Arct. Tern. *mihi*.

This species which has long been confounded with *Sterna Hirundo* (the Common or Greater Tern) was first indicated and described as a distinct species by M. Temminck, in the 2d edit. of the Manuel d'Ornithologie. It differs from it in having a bill somewhat shorter, and generally wholly red; shorter *tarsi*, and the breast and under parts of as deep a grey as the back. The outer tail feathers are also longer, and project further beyond the

closed wings. It is the most numerous of the Terns which resort to these Islands, and the colony occupies a considerable portion of *Brown's Main*. The eggs are placed so near each other that it is almost impossible to walk upon the part they inhabit, without crushing several in making the attempt. They are laid upon the bare ground or gravel, and differ very much in colour and marking. The young when excluded are covered with a party-coloured down, usually of a fulvous or brown shade, with darker variegations. They fledge very rapidly, and within a month from the time of hatching are able to fly. Their food is the fry of the *Ammodytes Tobianus* (Launce or Sand Eel) which is brought to them in great abundance by their parents. They arrive towards the middle of May, and desert their breeding station early in August.

Sterna Dougallii. Mont. Orn. Dict.

Hirondelle de mer Dougall. Temm. Man. d'Ornith. 2. 738.

Roseate Tern. Mont.

About fourteen years ago the keeper of the outer light-house first noticed this as a new and distinct species. Information was given me of the circumstance, and I went over to ascertain the fact, and having killed several, found them to be the *Sterna Dougallii* or Roseate Tern of Montagu. Since that period they have greatly increased, and now form a numerous colony, which occupies a large space of ground near to that occupied by the Arctic species, and a second station upon one of the Walmseys. Its eggs are rather larger than those of *S. Arctica*, and the young differ both in the early or downy, and in the feathered state. The old birds are easily recognised amidst hundreds of the other species, by their peculiar and buoyant flight, long tail, and note, which may be expressed by the word *crake*, uttered in a hoarse grating key. The following is the description of the young of the year; bill black, orange yellow at the base; forehead and crown of a very pale wood-brown; region of the eyes, ear coverts, and nape of the neck, black, the latter barred with pale wood-brown; back and wing coverts blueish-grey, barred with blackish-grey, the feathers tipped with yellowish-white; quills grey, the exte-

rior web of the first feather black ; tail grey, the exterior webs the darkest, the tips of the feathers white ; under parts white ; legs pale red.

Sterna Cantiaea. Gmel. 1. 606.

Sterna Boysii. Lath. Ind. 2. p. 806. sp. 10.

—— *Africana*. Gmel. Lath. &c.

Greater Sea Swallow. Albin. 2. pl. 88.

Sandwich Tern. Lath. Syn. 6. p. 356.

This elegant species till within the last two seasons frequented these Islands in great numbers, but the colony having been repeatedly disturbed and shot at, and the eggs taken away in the beginning of the season of 1824, they nearly all departed, and migrated to the Coquet Island, situated about 14 or 15 miles to the south of Farn. This season I found the colony reduced to a comparatively trifling number, which had selected a fresh station upon the Walmsey. The eggs of this species vary greatly in colour and markings, the prevailing one is a white or cream-coloured ground, with spots and blotches of a deep brown. Like the Arctic and Roseate Terns they prey upon the Sand-Launce and young Gar-fish, which they capture by precipitating themselves upon the shoals as they rise to the surface of the water.

Genus LARUS. Linn.

Larus fuscus. Linn. 1. 225. Lath. Ind. 2. p. 815. sp. 8.

—— *flavipes*. Meyer Tasschenb. 2. 469.

Lesser black-backed Gull. Mont. Orn. Dict.

Montagu in his Ornithological Dictionary has made a curious mistake, having appended the synonyms of the Herring Gull (*Larus argentatus*) to this species, and *vice versa*. It resorts to this station in great numbers, and colonizes two of the larger Islands, called the Walmsey and Marcus. The eggs are not easily distinguished from those of the Herring Gull, and the disposition of the colours of the young is similar, though they are darker. This species was long confounded with the *Larus marinus* (Great black-backed Gull) although it never attains one half its size,

and differs in the colour of its legs, which are yellow, whereas those of *L. marinus*, are livid or flesh-coloured. Early in Spring they assemble in large flocks upon the main land opposite, and are observed every afternoon to advance four or five miles into the interior, alighting at intervals upon a pasture or newly-sown corn-field. At this time they are very clamorous, and unite in exercising these notes or calls peculiar to, and indicative of the pairing season.

Larus argentatus. Brunn. Orn. Boreal. 44. No. 149. Gmel. Syst. 1. 600. sp. 18.

Goeland a manteau bleu. Temm. Man. d'Ornith. 2. 764.

Herring Gull. Lath. Syn. 6. 372. Penn. Arct. Zool. 2. 527.

A few individuals of this species breed annually in company with *L. fuscus*. They are easily distinguished by the paleness of the upper parts of the body, flesh-coloured legs, and longer bill. Their note is also different. In habits and manners they are very similar. Both species are three years in acquiring the adult plumage.

Larus tridactylus. Linn. 1. 224. Meyer Tasschenb. Deut. 2. 486.

La Mouette Cendrée. Briss. Orn. 6. 175. t. 16. f. 1.

Tarrock Gull. Lath. Syn. 6. 392.

Kittiwake. Penn. Arct. Zool. 2. 529.

This species differs from its congeners in the deficient structure of its hinder toe, which is indeed no more than a knob or stump unprovided with a nail. This difference however brings it in connection with, and shews its affinity to other succeeding groups, particularly *Haladroma* and *Procellaria*, and it thus serves to illustrate that doctrine of affinities and circular succession, which appears to exist throughout animated nature, and which has been so ably advocated, I may say demonstrated, by the pens of Mr. MacLeay and Mr. Vigors. Its habits are more oceanic, if I may so call them, than those of the more typical species of the *Lari*. It never like them advances into the interior, to feed upon worms

and other insects, nor can it from the comparative shortness of its *tarsi*, walk with the same degree of ease upon land; in all these particulars also it shews its affinity to the neighbouring *Procellaria*. The clefts and narrow ledges of the Pinnacles and perpendicular rocks opposite, are the places selected by the Kittiwakes for nidification; upon these, although in many instances not exceeding a hand's breadth in width, they build their nest and rear their young in security; the latter seem instinctively to feel their perilous situation, where the least movement would precipitate them into the waves beneath, and it is observed that they seldom change their situation or attitude in the nest, till they become nearly fledged, and able to provide for their own safety. Young herrings and other small fish constitute their food. They arrive in May, and leave this coast as soon as the young have quitted the nests.

I may conclude by observing that the Great Seal (*Phoca barbata*. Linn.) inhabits these islands and the adjacent sea. It attains a very great size, several having been killed during this last summer, which weighed upwards of 45 stone, of 14 lbs. to the stone, and measured from 10 to 12 feet in length. This species calves in the month of November upon several of the outer rocks, where the young are suckled every tide by the parent for the space of 14 or 15 days, when the long woolly fur which at first clothed them is cast, and a new covering of close short hair supersedes it; they are then conducted by the dam to the water, from whence they only emerge at intervals. The Common Seal (*Phoca vitulina*) although common upon the coast, is never seen near the Farn Islands. This species produces its young in July and August.

I have the honour to be,

Gentlemen,

&c. &c.

P. J. SELBY.

ART. L. *Sketches in Ornithology; or, Observations on the leading Affinities of some of the more extensive groups of Birds.* By N. A. VIGORS, jun. Esq. A.M. F.L. & G.S.

(Continued from p. 405.)

ON SOME SPECIES OF THE RHAMPHASTIDÆ.

THE opportunity so seldom occurs of figuring from a living specimen a bird of this family in which, as it is well known, many of the chief specifick characters are lost in death, that I am induced to insert a figure in this Journal of a *Rhamphastos* now alive in my possession; although in describing it I fear I shall rather increase than clear away the confusion that already exists in the nomenclature of the family. The bird in my possession was obligingly sent to me from Rio de Janeiro by my friend Dr. Such, with the observation that it was the only specimen of the species which he had himself met with, and that he had seen no description in any authour which exactly accorded with it. The bird however is not uncommon in our collections, although according to Dr. Such's observations not usually found in the neighbourhood of Rio de Janeiro; but the remark of that gentleman is perfectly just, that it can be referred with certainty to no recorded species. At the same time it must be observed, that we are not sufficiently acquainted with the variations of these birds as to age or sex, to authorize us to pronounce with confidence that the individuals which show apparent specifick distinctions are really distinct. In all such cases I consider it the most eligible plan to keep every bird separate under its own name and description, until it has been ascertained by authentick proof to be identical with some previously recorded species. I shall accordingly describe my bird; and then referring to the descriptions of the other named species of *Rhamphastos*, state my reasons for considering it distinct from all.

ARIEL. *Ramph. niger, gulâ genis guttureque aurantiaco-luteis, hujus margine inferiore sulphureo, regione periophthalmicâ*

*nudâ miniaceâ, fasciâ pectorali crisso uropygioque coccineis ;
rostro nigro, basi sulphureo-fusciato, culmine basi cæruleo.*

Rostrum tæniâ nigrâ gracili ad basin marginatum; deinde fasciâ latâ sulphureâ, in *mandibulâ* inferiore latiore, in superiore propè culmen strictiore, instructum; *culmine* ad basin strigâ longitudinali triangulari cæruleâ notato; *tomils* irregulariter leviterque serratis. Fascia pectoralis unciaë circiter latitudinem obtinet. *Pedes* cærulei, *unguibus* nigris. *Irides* cæruleæ. Longitudo corporis, 18; *alæ* a carpo ad remigem 4^{mm} , $7 \frac{2}{3}$; *caudæ*, $7 \frac{1}{2}$; *rostri*, $3 \frac{1}{16}$; *tarsi*, $2 \frac{1}{16}$.

The following are the species hitherto described of the genus *Ramphastos*, Auct. from authentick sources. The ground colour of all, it is to be observed, is deep jet black.

1. *R. Toco*. Gmel.—This appears to be a well known and well defined species. It has been figured by Dr. Latham in his "Synopsis," [pl. 9. Ed. 1^{ma}, and pl. 29. Ed. 2^{da}.] and in the 8th No. of the "Planches Enluminées."* The bill seems larger in proportion than that of any other species of the genus: it is yellowish white, at least in the dead bird, with a black *apex* to the upper mandible: a narrow black streak is found at the basal margin of both mandibles; a mark, which although subject to variation as to breadth, seems to be common to all the species. The cheeks and throat together with the upper tail coverts are white; and a slender scarlet band extends round the margin of the throat. The under tail coverts are scarlet. There is some variation respecting the scarlet band round the throat. A specimen now before me does not possess it, but a few of the lower feathers of the throat are slightly tinged with scarlet. In other specimens I have seen more or less extent to these scarlet markings, which, as far as I could form an opinion, appeared to depend upon the age of the bird. In the specimens which I have examined, the serration of the bill is faint and irregular, as in most of the species of this genus.

* Dr. Latham refers to M. Le Vaillant's plates 7 and 8 as belonging to this species. They represent *R. vitellinus*, Ill. [See SWAINS. Zool. Illust. pl. 56.] *R. Toco*, Linn. is figured by M. Le Vaillant in the first plate of his work.

2. *R. DICOLORUS*. Linn.—The specific characters given of this species in the “*Systema Naturæ*,” are very accurate as to the plumage, but those of the bill are not mentioned. The characters are as follows; “*nigricans, pectore abdomine* crisso uropygioque rubris, gula luteâ*.” In the synonyms of this species Linnæus evidently refers to two distinct species. The first of these is the *Tucana gutture luteo* of M. Brisson, [Vol. iv. p. 411. pl. xxxi. f. 1.] the description of which accurately agrees with the characters of his own bird. The second is the *yellow-breasted Toucan* of Edwards, [t. 329.] and is the next succeeding species to the present. Besides a material difference in the bill of these two birds, that of Mr. Edwards has a narrow scarlet pectoral band instead of having nearly the whole of the *abdomen* scarlet as in M. Brisson's bird; while the tail coverts are white instead of being scarlet. As of the two birds thus referred to, the species of M. Brisson accords most intimately with the characters in the “*Systema Naturæ*,” while that of Mr. Edwards materially disagrees with them, the former bird may justly be considered the true *R. dicolorus* of Linnæus.

The bill of the bird in M. Brisson's figure does not exactly coincide with his description in the text. But if we make allowance for the different appearances of the bill in a dried and recent state, we may detect the traces of the characters of the true bill in his figure, and in some measure reconcile it with his description. The same observation may be extended to the bird represented in the “*Planches Enluminées*,” [269] which appears to correspond very exactly with that in M. Brisson's plate. There is an excellent figure of this bird by M. Le Vaillant in his “*Histoire Naturelle des Toucans*,” [pl. 8.], and Mr. Swainson also has added an accurate and valuable representation of it in his *Zoological Illustrations*, [pl. 108.] Dr. Latham, who refers to a specimen in the Leverian Museum has also accurately described the species. But Dr. Shaw has at once sunk † the Linnean species

* The lower part of the *abdomen* and the thigh coverts are black. The scarlet however descends so far downwards as to give the *abdomen* the appearance of being generally marked with that colour.

† General Zoology. Vol. VIII. p. 365.

R. dicolorus; united into one species Linnæus's descriptions of that bird and of his *R. tucanus*, together with the birds respectively figured in the Pl. Enl. 269 and 307; and apparently without having any specimens before him, at least without referring to such, has created a new species under the name of *R. pectoralis*.

Of this species I have lately seen a considerable number of specimens, which were brought to this country by Dr. Such from the neighbourhood of Rio de Janeiro. They appeared to accord accurately with each other, the length only of the bill being excepted, in which there was much difference, the bills of some species exceeding those of others by more than an inch. The little variation in colours that thus appeared among so many specimens of this species, confirms me in my suspicions that there are not so many varieties in the species in general of this group as have been alleged. The bill of the bird may be described from these specimens in conjunction with the descriptions of the before-mentioned naturalists to be olivaceous or greenish yellow, paler towards the base and the *culmen*, with a black band at the basal margin, broader than in most of the *Ramphasti*, and a narrow red streak along the edges of the mandibles. In most of the specimens that have come before me, both the mandibles are margined with red. But there appears some slight variation in this character, as the bird from which Mr. Swainson took his figure had the upper mandible only edged with that colour. Of two specimens now before me, one has the bill $4\frac{1}{2}$, the other $3\frac{3}{8}$ inches long from the *rectus* to the *apex*. In other specimens I have noticed an apparently greater difference in length, but I did not take the measurement.

3. *R. CARINATUS*. Swains.—This is the bird figured by Mr. Edwards in his 329th plate, and which seems to have been erroneously referred to by Linnæus as identical with the preceding species *R. dicolorus*. Mr. Swainson, to whose zeal we are indebted for much information on this family, has with great justice separated this species under the above name in the text to the 45th plate of his Zoological Illustrations: having previously ascertained the accuracy of Mr. Edwards' description and figure of the bill, one of the chief characteristics of the species, by means

of a perfect bill in his own possession. He also states in addition to this testimony that he possesses "an original sketch in oil of another individual, by an unknown artist, with a note stating it was done from the life at Exeter Change."

From Messrs. Edwards and Swainson's figures and descriptions of this bird, it appears to have a white *uropygium*, and a narrow pectoral bar of scarlet with under tail coverts of the same colour. "The bill," in Mr. Edwards' own words, "is very great in proportion, compressed sideways, having a sharp ridge along its upper part;—the upper mandible is green, with a long triangular spot * of orange colour on each side, and the ridge on the upper part yellow; the lower mandible is blue, with a shade of green in the middle, the point is red: it hath about five transverse faint dusky bars, which cross the joinings of the two mandibles."

Although Linnæus referred to this bird of Mr. Edwards as identical with his *R. dicolorus*, both M. Gmelin and Dr. Latham have introduced it as belonging to another species of that authour, his *R. tucanus*. This error appears still greater, when we find that Linnæus not only did not quote this 329th Plate of Mr. Edwards under the head of his *R. tucanus*, but actually quoted for that species a totally different figure of that authour, the figure represented in his 238th plate. This misquotation of Linnæus's references has caused considerable confusion, as many naturalists

* Dr. Latham, in describing the bill of this bird after Mr. Edwards, says that it has "the upper mandible green, with *three* long, triangular spots of orange on each side." [Syn. Vol. I. p. 326. Ed. 1^{ma}—Vol. II. p. 283. 2^{da}.] He refers the figure to *R. tucanus*, Linn.

In noticing and endeavouring to rectify these and similar incidental errors which occasionally appear in the writings of some of our best Ornithologists, I hope I may not be suspected of wishing to impeach their general accuracy or acumen. In a subject so beset with intricacy and difficulties as is the collation of synonyms, and the identification of species, more particularly in this country, where so little assistance is afforded the Naturalist, in extensive national collections or libraries of reference, it is almost impossible to steer clear of errors of this description. I think it necessary to mention such venial *errata*, wherever I detect them, assuming the office which the authours themselves would undertake had they similar opportunities for correction. And I hope that my own mistakes may meet with equal candour and pardon in return:—hanc veniam petimusque damusque vicissim.

consult Gmelin's edition of the "*Systema Naturæ*," taking it for granted that it is a faithful transcript of Linnæus's original work, without consulting that work itself. Dr. Shaw goes even further in encreasing this confusion, for he describes this bird only as the *R. tucanus* of Linnæus; and though he gives Linnæus's character of that species, he alters them into totally different characters of his own to suit the figure which he has thus gratuitously adopted. He also refers to the bird figured in Petiver's "*Gazophylacium*," [t. 44. f. 13.], as identical with the species represented in this 329th plate of Mr. Edwards, although that gentleman expressly stated that Mr. Petiver's figure accorded with quite a different bird, the species figured in his 238th plate.

4. *R. VITELLINUS*. Ill.—This bird is very beautifully figured by Mr. Swainson in the 56th plate of his *Zoological Illustrations*. It appears a distinct and well marked species. To use that gentleman's words, "the throat is yellowish-orange; the sides and ears white; the pectoral bar and tail coverts are red; the bill is black, with a blue basal belt, the top convex, and but slightly curved, the sides thickened." I have a specimen of this species before me, which exactly agrees with this description, and I have noticed some others which equally accorded with it.

5. *R. TUCANUS*. Linn.—There is much confusion with respect to this species. The bird which Linnæus first described under this name, was that figured by Mr. Edwards in his 238th plate, under the name of *Tucana rostro rubro*, and which is the species now known as the *R. erythrorhynchus*, Gmel. His characters verify his reference. The words "*Ramphastos rostro rubro carinâ obtusâ albidâ*" distinctly point out that species. This was the *R. tucanus* of his 10th Edition of the "*Systema*." In the 12th Edition of that work however, he materially alters his characters and his references. There his specifick characters are "*R. nigricans, fasciâ abdominali crisso uropygioque flavis*." And in his further description of the bird, he adds these marks of distinction, "*rostrum flavescens, versus basin fasciâ nigrâ; collum subtus et genæ albæ*." In his synonyms also of this species, he includes the "*Tucana Brasiliensis gutture luteo*" of M. Brisson, referring at the same time to the figure of that bird,

[Vol. iv. pl. 32. f. 1.], and still retaining his reference to Mr. Edwards's figure. There are evidently two birds included in this last description. For M. Brisson's figure not only differs from that of Mr. Edwards's bird, but the difference is pointed out by the latter bird being also accurately figured and described as a distinct species in the "*Ornithologie*," [Vol. iv. p. 416. pl. 31. f. 2.] under the appellation of *Tucana Cayennensis gutture albo*. Linnæus, in describing them under one name, probably considered them as the sexes of the same species.

Of the two birds thus included by Linnæus in his description of *R. tucanus*, the first ought properly to be considered the original type of that species. But as that bird has long been known under the name of *R. erythrorhynchus*, Gmel., and as it is a very common species in our collections, much confusion might arise by altering the name under which it has so long been distinguished. The second bird therefore to which Linnæus refers in his last edition, may be chosen as the representative of the true *tucanus* of that author.

I have never seen an individual that exactly accorded with Linnæus's specifick characters of this bird, as amended in his last edition. The existence however of the species has been placed beyond doubt by M. Le Vaillant, who obtained two specimens of it at Lisbon, which had been brought from the New World, and which he figured and described in his work * on these birds [pl. 4.] One of these specimens he retained in his own cabinet: the other he transferred to the collection of M. Raye of Amsterdam. His description and figure intimately accord with Linnæus's description of the species: the yellow pectoral band, and the under and upper tail coverts of the same colour, answering to the "*fasciâ abdominali crisso uropygioque flavis*" of the "*Systema Naturæ*." The bill also generally corresponds with Linnæus's description of that member. M. Brisson's figure and description, to which Linnæus referred, do not so closely accord with the same

* M. Le Vaillant hesitates in referring his bird to *R. tucanus* Linn., in consequence of its not agreeing with Mr. Edwards's figure, in his 329th plate. But Linnæus himself did not refer to that figure for his *tucanus*: it was Gmelin, as has been before observd, who erroneously introduced that reference.

characters. Both M. Gmelin however and Dr. Latham modify* these characters by stating that the yellow colour of the pectoral *fascia* and of the tail coverts incline in some instances to red. With this modification the characters of *R. tucanus* will sufficiently correspond with M. Brisson's figure, and with the figure in the 307th No. of the "Planches Enluminées:" they also correspond with Dr. Latham's description of the species, if we exclude his reference to Mr. Edwards's bird in the 329th plate of his work, which we have already seen belongs to the *R. carinatus*, Swains. Both M. Brisson and Dr. Latham refer, it is to be observed, to specimens of this bird; the first to one preserved in the Museum of M. Reaumur, the latter to specimens in the British and Leverian Museums.

From the descriptions then of so many naturalists, and on these authorities, we may distinguish this Linnean species by the following characters. The throat and upper breast are of an orange colour, inclining to white on the sides. A narrow pectoral band, of about five lines in breadth, according to M. Brisson, together with the under tail coverts, are yellow inclining in some instances to red; while the upper tail coverts are universally described as yellow.

6. *R. ERYTHORHYNCHUS*. Gmel.—This is the bird figured by Mr. Edwards in his 238th plate, and which was originally intended by Linnæus to represent his species *tucanus*. It was first named and characterized by M. Gmelin in his edition of the "Systema Naturæ." It has also been described and figured by M. Brisson. [Vol. i. p. 416. pl. 31. f. 2.] and figured in the 262nd plate of the "Pl. Enluminées." The figures in Borowski's "Naturgeschichte," [II. p. 97. 1. t. 6.], and in Petiver's "Gazophylacium," [t. 44. f. 13.] which have been referred by Dr. Latham to the preceding species *R. tucanus*, belong to this bird.

The characteristick marks of this species which is by no means uncommon in our cabinets, and an individual of which was some short time since alive in this country,† may be stated to be as follows. The throat and upper parts of the breast are of pure

* GMEL. Syst. I. p. 355. LATH. Ind. Orn. p. 136.

† See Zool. Journ. Vol. I. pp. 484, 586, 591.

white; this is margined by a scarlet *fascia* on the lower part. The under tail coverts are scarlet, and the upper sulphur yellow. The bill is long, marked at the base by the usual narrow black margin; then by a broad yellow *fascia*, and on the *culmen* by a broad longitudinal yellow streak which extends the whole length and includes the *apex*: the rest of the bill is fine red, partially clouded with black, and verging to that colour towards the yellow *fascia*, thus forming a second transverse band of black adjoining and parallel to the yellow band. The base of the under mandible, according to Mr. Edwards, inclines to purplish and the *apex* to black. M. Brisson says that the eyes are black, and the naked skin around them cærulescent. He appears to have drawn his description from a living bird in the collection of M. Reaumur, as he speaks of its omnivorous habits.

7. *R. TOCARD*. Vieill.—This species has been figured by M. Le Vaillant in his 9th plate, and given the above name by M. Vieillot in the “*Dictionnaire d'Histoire Naturelle*.” The throat and upper parts of the breast are white, and the usual pectoral band and upper and lower tail coverts scarlet. The bill is black with a yellow longitudinal band running diagonally across the upper mandible from the base above to the lower edge which it meets about the distance of one third part from the *apex*. I have just observed a bird in Mr. Leadbeater's valuable collection, which exactly accords with this description, with the exception of the upper tail coverts being yellow.*

8. *R. PISCIVORUS*. Linn.—The existence of this species chiefly rests on the authority of Mr. Edwards, who figured it in his 64th plate, from a living specimen. From his figure and description Linnæus seems to have named and characterized the species. M. Brisson has also described the bird, but it is doubtful whether from a specimen, or from Mr. Edwards's description. In this instance he does not refer to any specimen, which is usually his

* Mr. Leadbeater informs me that this bird, which appears to have been set up a length of time ago, is defective in the plumage of the back; and that feathers have been added to supply the deficiency. It is probable that the yellow feathers of the *uropygium* have also been added from another species, perhaps from *R. erythrorhynchus*.

practice, when he describes from the bird itself: at the same time in referring to Mr. Edwards's plate, he terms the figure represented in it "tres exacte," which would not in all likelihood have been the case, if he had not had a specimen before him by which he could determine its accuracy. Linnæus refers to Ray's *Xochitenacatl tertia* as a synonym of this bird, and this reference has been generally copied by succeeding writers when describing it: but Mr. Ray himself merely speaks* of the bird at second hand; referring to the description of it in Fernandez, and even expressing his doubts whether it may not be the same as his own *Pica Brasiliensis*, the *R. picatus* of Linnæus. The bird described by Mr. Bancroft† as the *Toucan of Guiana*, as well as the figure in the Pl. Enl. 262,‡ both of which are included by Dr. Latham in his references of this bird, belong to *R. erythrorhynchus*, Gmel. Little light therefore is thrown upon this species by any of the authours who are referred to as describing it: and on the whole, as the fact of M. Brisson's having seen the bird itself is somewhat doubtful, it seems to rest on the authority solely of Mr. Edwards.

From his description the species may be distinguished as follows. Its throat and the upper parts of its breast are white, or rather cream-colour, with a lunulated *fascia* beneath of fine red, which is softened both above and below into the adjoining colours; the under tail coverts are pale red, the upper white. The bill has the upper mandible of a pale yellow greenish colour, the lower of a fine blue colour, faint towards the head and stronger towards the point: the point itself of both the upper and lower mandibles, for above an inch deep, is of a fine scarlet colour; and the sides of both, near the edges, have a long cloud of orange colour transversely barred with black or dusky lines, which pass through the divisions of the bill a little way into the sides of the lower mandible.

* Syn. Meth. Av. Appendix. p. 178.

† Essay on the Natural History of Guiana. p. 163.

‡ Dr. Latham has rectified this reference to the "Planches Enluminées" in his "Index Ornithologicus," and in the second Edition of his "Synopsis."

9. *R. AMBIGUUS*. Swains.—This species stands exactly in the same situation as the last. It rests on the authority of a drawing to which a note was appended stating that it was taken “from the bird just dead.” We are indebted for the publication of the species to the zeal of Mr. Swainson, who expresses his reliance on the authenticity of the figure, in consequence of the accurate accordance of several other drawings executed by the same artist, and now in his own possession, with well known species. I make no doubt that this and the foregoing species, together with many others obscurely described by early authors, will be brought to light, as the interior of the vast territory of South America, scarcely more than the outskirts of which are now known to naturalists, comes to be more extensively explored.

Mr. Swainson has given an interesting figure of this bird,* from which and his description the following characters may be drawn. The throat and upper parts of the breast are yellow. The usual pectoral band, somewhat narrow, and the under tail coverts are scarlet: the *uropygium* white. The characters of the bill are in Mr. Swainson's own words, as follows ;—“*mandibulæ superioris parte superiore flavâ, transversè maculatâ, strigâ viridi obliquè divisâ: mandibulâ inferiore nigrâ.*”

10. *R. PICATUS*. Linn.—Although I have often heard of this species, which is commonly known under the name of the *Preacher Toucan*, as being in different collections in this country, I never had an opportunity of examining a specimen. I am inclined to suspect that it does not belong to the present genus, but rather to *Pteroglossus*, Ill. It has the bill of that group, as far at least as can be judged from a single figure, the serrations of the edges being strongly marked and even, and the nostrils being conspicuous at the upper part of the bill, at the base. The disposition of the colours are equally indicative of its connection with the *Pteroglossi*. But the tail is represented as even in Mr. Albin's figure of the bird,† the only figure I have seen of it, and des-

* Zool. Illust. Pl. 168.

† Nat. Hist. of Birds. Vol. II. No. 25.

cribed also as such by M. Brisson.* If all these characters are stated correctly, the species forms an interesting bond of connection between the *Ramphasti* and *Pteroglossi*.

This bird seems to have been among the first of the family which were known to the early ornithologists. It appears to be the *Pica Brasiliensis* of Gessner, Aldrovandus, and Ray, and the *Tucana* of M. Brisson. The following are the specific characters given by Linnæus:—*R. nigricans, pectore luteo, crisso rectricumque apicibus rubris, uropygio nigro*. The bill is said to be yellowish clouded with dark green, the *apex* inclining to red.

There are still some species described as belonging to this family, which cannot be referred with certainty to either of the two genera described in it: such as the *R. torquatus, pavoninus, luteus, cæruleus, & dubius*. Gmel. Most of these seem to have been characterized and named from the descriptions of some of the older authours, particularly Fernandez, who enumerates many apparently different species, in his "*Historia Novæ Hispaniæ*." The last species was described on the authority merely of a list of birds belonging to a collection in France. Many of these species will probably be hereafter recovered to science. But in the present state of doubt respecting their authenticity, it would be unsafe to exalt them to the rank of species, or notice them further than by a casual reference.

I have been led into this long, and I fear tedious enumeration of species and synonyms, with the view of pointing out the difference of my bird from all those which have been hitherto described from authentick sources. From the description given above of this bird, it will be evident that it can be referred with certainty to none of the foregoing species. The species to which it approaches most nearly is the *R. tucanus*, Linn.: and ornithologists in general on a casual inspection, have assigned it that name. But it will be seen that it in no respect corresponds with Linnæus's original description, or with the most authentick figure which we have of the species, that of M. Le Vaillant. It is true as I have before observed, that as Linnæus referred to M. Bris-

* Ornithologie IV. p. 402. M. Vieillot makes the species a *Ramphastos* in the "*Dict. d'Hist. Naturelle*."

son's figure as representing his own *tucanus*, we may so far modify his description of the species as to make it accord with that of M. Brisson. And we might also modify the figure and description of M. Brisson's bird, so as to make it agree in general with my *R. Ariel*. But still there are one or two particulars in which these two birds disagree, which cannot at once be reconciled. In my bird the throat and upper part of the breast are of an uniform orange buff colour, while in *R. tucanus* the sides are described as white: and both Linnæus himself and M. Brisson, as well as the later writers who have described the latter species from actual specimens, agree in assigning it a yellow *uropygium*, while that of the bird now before us, is of a bright scarlet. A considerable difference may also be traced in the bills of these birds; although from mine being a live bird and the colours of the bill consequently vivid, and the descriptions to which I refer being probably taken from faded specimens, no stress should be laid on this point. The difference in these characters may be said, it is true, to be the mere effect of age or accident: it may be equally conjectured to be the indication of a difference in sex. But we have hitherto no proof of such a fact: and until this variation has actually been ascertained to obtain in the species, I consider it, as I have already observed, more consistent with the accuracy of science, to keep the birds distinct in which so marked a difference is displayed.*

With respect to the manners of my bird, I can add but little to the very accurate and interesting account of those of a species nearly allied to it, which has appeared in a preceding number of this Journal.† I have not allowed it to be indulged in that disposition to animal food, which so strikingly belongs to this family. I find in fact that it thrives sufficiently well upon a vegetable diet, and I fear that if it should once be allowed any other, it would be difficult to restrain its inclination for it within moderate limits. Eggs are the only animal food with which it has been supplied

* Since the above observations were sent to press, I have had an opportunity of inspecting M. Vieillot's "Galerie des Oiseaux," in which I perceive my bird is figured under the name of *Le Toucan du Para*.

† Vol. I. p. 484.

since it came into my possession. Of these it is particularly fond: and they are generally mixed up in his ordinary food, which consists of bread, rice, potatoes, German paste, and similar substances. He delights in fruits of all kinds. During the period when these were fresh, he fed almost exclusively on them; and even in the present winter months he exhibits great gratification in being offered pieces of apples, oranges, or preserved fruits of any description. These he generally holds for a short time at the extremity of his bill, touching them with apparent delight with his slender and feathered tongue, and then conveying them by a sudden upward jerk to his throat, where they are caught and instantly swallowed. His natural propensity to preying upon animals, although not indulged, is still strongly conspicuous. When another bird approaches his cage, or even a skin or preserved specimen is presented to him, he exhibits considerable excitement. He raises himself up, erects his feathers, and utters that "hollow clattering sound," noticed by Mr. Broderip, which seems to be the usual expression of delight in these birds:—the *irides* of his eyes at the same time expand, and he seems ready to dart upon his prey, if the bars of his cage permitted his approach. On one occasion when a small bird was placed by chance over his cage at night, he shewed great restlessness, as if aware of the neighbourhood of the bird, and he would not be composed until the cause of his anxiety was discovered and removed.

When in his cage he is peculiarly gentle and tractable, suffers himself to be played with, and feeds from the hand. Out of his cage he is wild and timid. In general he is active and lively: and contrary to what might be expected from the apparent disproportion of the bill, and the seemingly clumsy shape of the birds of this genus, as they are usually set up or represented in figures, his appearance is not only graceful, but his movements, as he glides from perch to perch, are light and sylphlike; so much so as to have suggested to an intelligent friend who witnessed them, the specifick name which I have ventured to assign him. He keeps himself in beautiful plumage; his lighter colours being strikingly vivid, and the deep black of his upper body in particular being always bright and glossy. For this fine condition he

seems to be much indebted to his fondness for bathing. Every day he immerses himself in cold water with apparent pleasure even in this severe weather: and in no respect indeed does he appear to suffer by the transition from his own warm climate to our uncongenial atmosphere.

Besides the "hollow clattering noise," as my friend Mr. Broderip so expressively terms the usual sounds of these birds, he utters at times a hoarse and somewhat discordant cry, when he happens to be hungry, and to see his food about to be presented to him. On such occasions he stands erect, raising his head in the air, and half opening his bill as he emits this cry. These are the only sounds I have heard him utter. And in neither can I say that I have detected any similarity or even approach to the word *Toucan*, as has sometimes been asserted, and from whence the trivial name of the genus has been supposed to originate. Neither have I been able to verify another observation which has been advanced respecting these birds,—that the bill is compressible between the fingers in the living bird. The bill, notwithstanding the lightness of its substance, is firm, and capable of grasping an object with much strength. The mode in which Mr. Broderip describes his *Toucan* as having broken the limbs of the bird which he was about to devour, by "a strong lateral wrench," sufficiently shows that the bill is not deficient in power. Indeed I generally observe that my bird takes what is offered him, rather by the sides than by the point of his bill: and I suspect that much of the powers of that member are centered in this lateral motion. The serration of the edges also may be supposed to tend to these peculiar powers.

The manner in which he composes himself to rest is represented in the accompanying plate. Since the cold weather has commenced he has been brought into a room with a fire, and the unusual light seems to have interfered with his general habits: he does not go to rest as early or as regularly as was his custom; and he sometimes even feeds at a late hour. During the warmer months, however, when he was more free from interruption, his habits were singularly regular. As the dusk of the evening approached he finished his last meal for the day, took a few turns,

as if for exercise after his meal, round the perches of his cage; and then settled on the highest perch, disposing himself, almost at the moment he alighted on it, in the posture represented in Pl. XV. fig. 2.; his head drawn in between his shoulders and his tail turned vertically over his back. In this posture he generally remained about two hours in a state between sleeping and waking; his eyes for the most part closed, but opening on the slightest interruption. At such times he would allow himself to be handled, and would even take any favourite food that was offered him, without altering his posture further than by a gentle turn of the head. He would also suffer his tail to be replaced by the hand in its natural downward posture, and would then immediately return it again to its vertical position. In these movements the tail seemed to turn as if on a hinge that was operated upon by a spring. At the end of about two hours he began gradually to turn his bill over his right shoulder, and to nestle it among the feathers of his back, as is represented in fig. 3.; sometimes concealing it completely within the plumage, at other times leaving a slight portion of the *culmen* exposed. At the same time he drooped the feathers of his wings and those of the thigh coverts, so as to encompass the legs and feet: and thus nearly assuming the appearance of an oval ball of feathers, he secured himself against all exposure to cold.

Genus. PTEROGLOSSUS. III.

I do not find any description that exactly corresponds with the following bird, of which a fine specimen is in my possession. I obtained it some short time back at an auction of birds, without any notice of its locality.

BITORQUATUS. *Pl. olivaceo-viridis, capite nigro, gulâ guttureque castaneis, hoc subtus nigro-marginato, torque pectorali angustâ abdomine crissoque sulphureis, pectore nuchâ uropygioque coccineis: mandibulâ superiore flavo-albescente, inferiore albidâ fasciâ obliquâ apicali nigrâ.*

Supp. Pl. 17.

Pectoris plumæ basi fuscæ, apice sanguineo-coccineæ; superiores in medio sulphureæ. *Abdominis* plumæ basi fuscæ, apice sulphureæ; quibusdam lateralibus prope fasciam pectoralem sitis sanguineo-coccineo ad apicem notatis. *Tectrices* inferiores fusco-albidæ. *Remiges* supra fuscæ, externæ olivaceo-viridi marginatæ; subtus fuscæ, ad basin internæ pallidiores. *Rectrices* olivaceo-irides, subtus pallidiores. *Tectrices* femorales pallidé olivaceo-irides. *Rostrum* marginè gracili aurantiaco prominente instructum: *mandibulâ* superiore pallidé flavo-albidâ, profundè serratâ, subtus strigâ nigrâ serras comprehendente marginatâ; inferiore vix serratâ, fasciâ latâ nigrâ apicali, a basi supra obliquè descendente mandibulamque in partes æquales dividente, tæniâque gracili nigrâ, marginem basalem aurantiacum attingente ornatâ. *Longitudo corporis*, 15; *alæ* a carpo ad remigem 5^{iam}, 4 $\frac{1}{4}$; *caudæ*, 5 $\frac{2}{3}$; *rostri*, 2 $\frac{2}{10}$; *tarsi*, 1 $\frac{2}{10}$.

The species to which this bird bears the nearest resemblance, is the *Pt. Azara* of M. Vieillot, described in the "Dictionnaire d'Histoire Naturelle."* It has the same colours, and nearly the same distribution of them. But my bird does not possess the second black band that separates the scarlet of the breast from the yellow of the *abdomen* in M. Vieillot's bird: nor has the latter bird the yellow collar that adjoins the black *fascia* on the breast, or the scarlet nuchal band that is found on my bird. In a family like the present where the species approach each other so nearly in their colours, such differences as the foregoing are important in the discrimination of species. At the same time it must be observed that the colours of the sexes among the *Ptero-*

* M. Vieillot refers to plate A. of M. Le Vaillant's work on this family. The only copy that I have been able to consult of this splendid work in this country is in the possession of my friend Mr. Children of the British Museum, and this plate is by some accident wanting. I have not therefore been able to compare my bird with M. Le Vaillant's figure of *Pt. Azara*. The want of such books of reference in our public libraries is a material obstacle to the advance of science. I have lately however seen M. Vieillot's own figure of this species. [Gal. des Ois.] The bill deviates much more from that of my bird than I was led to suppose, from the description in the "Dictionnaire d'Histoire Naturelle." From the inspection of this figure I am strengthened in the opinion that my bird is specifically distinct from *Pt. Azara*.

glossi differ very materially. And from the general accordance of the bill of my bird with the description of that of M. Vieillot's,—that member affording perhaps the strongest characters for the determination of species in this group,—I should not feel surprised at finding that the two birds are merely sexes of the same species. Until this fact however is actually ascertained to be the case, I think it more accordant with the accuracy of science to keep them separate.

[*To be continued.*]

ART. LI. *An Account of a new or fifth Species of the Genus Psaris*, Cuv. By P. J. SELBY, Esq. F.L.S. M.W.S., &c.

GENTLEMEN,

ON perusing Mr. Swainson's paper, contained in the 7th Number of your Journal, giving an account of two new species of the genus *Psaris* of M. Cuvier, I was led to refer to some notes relative to this genus, which I made in Autumn last, during an excursion to the Continent undertaken principally for the purpose of visiting the national Museums of Holland and France. Upon comparing these with Mr. Swainson's descriptions, an additional species, perfectly distinct from the two he has described, was noticed; and I am enabled from these notes, in conjunction with a drawing of the Head of the Bird, made at the time, to offer the following specific description.

Fam. LANIADÆ. Vigors.

Subfam. TYRANNINA.

Genus. PSARIS. Cuv.

PSARIS ERYTHROGENYS.

P. supra griseus, genis rufis, capite alis caudâque nigris; infra griseo-albidus.

Above ash-gray, cheeks red, crown, wings, and tail black; beneath grayish white.

Description.

Size nearly that of *Psaris Cayanus*. Crown of head and nape pitch-black, space between the bill and eyes, and eye streak white, tinged with red. Cheeks and ear-coverts deep reddish brown. Back, rump, and wing-coverts ash-grey, the tips of some of the feathers black.* Wings and tail black. Breast and belly greyish white, under tail-coverts white. Bill blueish black, rather broader than that of *Psaris Cayanus*.

A specimen of this species is placed by the side of *P. Cayanus* in the Parisian Museum, but without a ticket attached to it, merely stating it to be from Pernambuco. In the valuable cabinet of the Baron Laugier is another specimen, likewise unnamed. This species, in its form and the distribution of its colours, is nearly allied to *P. Cayanus*.

In the Parisian Museum *Psaris cristatus* of Mr. Swainson is placed at the extremity of the *Thamnophili*, and ticketed *Lanius atricilla*. Its appearance immediately arrested my attention and that of a friend who accompanied me; and I find that we considered it at the time as possessing the characters of a true *Psaris*. We afterwards found it placed among that group in the Baron Laugier's collection, under the title, I think, of *P. atricilla*.

I am, Gentlemen,

Yours, &c.

P. J. SELBY.

ART. LII. *Description of a new Species of TERRAPENE; with further Observations on T. CAROLINA and T. MACULATA.* By THOMAS BELL, Esq. F.L.S.

Fam. EMYDINÆ.

Subfam. STERNOTHERINA. Bell.

Genus. TERRAPENE. Merr.

* The black tips probably indicate immaturity of plumage.

BICOLOR.—*T. testá glabrâ tricarinatâ, fuscâ ; sterni flavescentis squamis fusco unimaculatis.*

Habitat in Americâ septentrionali.

Mus. Nost.

Icon. Tab. xvi.

Description.

This species bears considerable resemblance to *T. maculata*, but it is distinctly tricarinated, grows to a much larger size, and totally differs from that species in colour. The scales of the back are smooth, with the area of each raised. The upper part of the head and neck is of a dull brown colour, as are also the feet, tail, and the whole of the upper shell. The under part of the head, with the plates of the sternum are of a pale yellowish colour, each of the latter having a broad dark coloured spot at the area. The head is even smaller than in the other species of the genus, although the animal is almost twice as large; it is marked with a yellow line on each side passing from the nostrils over the eyes to the beginning of the neck. The eyes are black and very small.

	Inches.
Length of the upper shell	8..0
Breadth of ditto	5..5
Length of the sternum	6..5
Breadth of ditto	4..0
Height of the animal when at rest...	3..5

In its habits this Tortoise is excessively timid, remaining almost constantly within its shell, and if now and then it is surprised when walking, it instantly retreats within its box in which it afterwards remains closely concealed. In this respect it differs remarkably from those species which bear the nearest structural relation to it. Since the living specimen now in my possession came to my hands, my friend Mr. James de C. Sowerby has had the kindness to present me with a shell of the same species which he had living some years since; and these are the only two specimens I have seen or heard of. In this individual the sternum is very concave in the middle of the posteriour valve; a structure

which is usually considered as characteristic of the male sex : but which is here proved not to be peculiar to it, at least in the subfamily of the box tortoises, as Mr. Sowerby informs me that two eggs were found in the body.

I have great satisfaction in being able in some measure to confirm the observations which I made in the last number of the Zoological Journal, respecting the distinct specific characters of the three species of *Terrapene*, previously confounded under the trivial name *Clausa*. I have now living a specimen of *T. maculata* and one of *T. Carolina*, which, while they retain the essential distinctions in the shell pointed out in the paper on the Box Tortoises, exemplify an equal difference in the markings and colours, as well as even in some measure in the structure and habits of the animals. In *T. maculata* the head, neck, and fore feet are of a bright scarlet spotted with black, and it is certainly one of the most shewy and beautiful animals of the order. The head is much larger, and the upper mandible more hooked, and projects farther beyond the under than in *T. Carolina*. The iris is of a brilliant scarlet with an inner rim of bright yellow, the two colours radiating as it were into each other ; the pupil black.

In *T. Carolina* on the other hand the general colour of the head and feet is a dull orange, obscurely marked with brown. The iris in this species is also scarlet, but of a deep hue and without the yellow ring. It is much more bold and active than the former, feeding readily on meat ; and I have known it even in its present unnatural and semidomestic state, attempt to pursue a frog round the room ; which is quite consistent with the habits assigned to it by Shaw. Edwards's description, which is very correct and complete, can only refer to this species, which leads me to believe that he was unacquainted with *T. maculata* and *T. nebulosa*.

ART. LIII. *On Insects which affect Oaks and Cherry Trees.* By the late Professor W. D. PECK.*

CAMBRIDGE, U. S. Jan. 30th, 1819.

It has been observed that America is "the land of insects." This observation is strikingly just as applied to the meridional and tropical parts of this quarter of the globe; in which these animals are equally remarkable for their numbers, and conspicuous for their magnitude; but it may, perhaps, be as truly said of a great part of the northern portion of it, where, though much diminished in volume and often very minute, the observer will find them surprisingly copious. These diligent and faithful servants of nature, as Linnæus calls them, are perpetually engaged in destroying all that is dead, and in checking the increase of all that is living in the vegetable world. In the execution of the task assigned them, they often frustrate the designs and subvert the arrangements of man; thus constraining him to attend to objects which are generally deemed beneath his notice, and obliging him to feel how effective is the smallest instrument in the hand of Omnipotence.

In this paper it is intended to lay before the Board of Trustees of the Massachusetts Agricultural Society, some notices of two insects, one of which inhabits the forest; the other is injurious to fruit trees.

For several years past the ground beneath the black and white oaks, has been observed to be strewed with small branches of those trees from eighteen inches to two feet in length. Mr. Sullivan assures me he has found them five feet in length, and an inch in diameter. The falling of these branches is occasioned by the larva or grub of an insect which, when its feeding or larva state is nearly complete, eats away the wood in a circular direction, leaving only the bark entire; this is broken by the first strong breeze, and the branch, with the larva in it, falls to the ground. From this effect of its labours, it may be called the Oak-pruner.

* From the Massachusetts Agricultural Repository and Journal, Vol. V.

At the meeting of the Board of Trustees at the seat of Gorham Parsons, Esq., on the 23rd of July last, the Hon. Mr. Sullivan produced several branches of oaks which contained larvæ. Five of these I brought home, reduced them to four or five inches in length; and in order to determine whether the larvæ descended into the earth, threw them into a vessel nearly filled with light garden mould, covering the vessel with a piece of window-glass, both to prevent the escape of the perfect insects, if any should be disclosed, and to retard the drying of the mould.

I imagined that as the larva is enclosed in the fallen branch with a sufficient supply of nutriment to carry it through the feeding state, it was intended it should enter the earth when that state was passed, and that it was impelled by instinct to cut off the branch, that it might be brought in safety to the ground before it was quite ready to quit the wood; but my conjecture was erroneous: there must be some other reason for this process.

A degree of humidity is necessary to favour the development of the parts of the perfect insect while it is in the nymphæ state; in the body and larger branches of trees the moisture is sufficient for this purpose; but in these small branches, which are killed, the moisture would be exhaled by the action of the sun and wind if they remained on the tree, whereas, by their falling, and being thus placed nearly or quite in contact with the moist earth, their humidity is preserved. It was not precisely with this view, that the prepared branches were treated as above mentioned; but the purpose was attained. The vessel was kept in a warm room, the wood was kept moist and one perfect insect made its appearance in November, another in December; but I believe they would not have been disclosed till the spring, if the branches had remained abroad.

The insect belongs to a tribe composed of a number of genera called Capricorn-Beetles and Wood-eaters. The genus of which it is an undescribed species, is named by Fabricius, *Stenocorus*. Linnæus would have called it *Cerambyx*. It is of a dull brown colour, a little brighter on the under-side, every where dotted with impressed points, and sprinkled with short whitish hairs which lie close to the surface; these give it a grayish hue under

the magnifier. The antennæ are about as long as the whole insect, tapering a little from the base to the point, and have ten joints, of which the second and third terminate in a small spine. The thorax is even, without any prominences; and the elytra or wing-cases have each two points at the apex. Individual insects differ considerably in magnitude, from four and a half to six-tenths of an inch in length. Their form is slender; the largest is only $\frac{12}{100}$ of an inch in breadth at the base of the elytra. It may be called *Stenocorus (Putator) obscurè-brunneus, albido-pilosus*; thorace inermi; elytris bidentatis; antennis longitudine corporis, articulis 2^{do} et 3^{uo} spinulâ terminatis.

This insect is probably diffused over a large portion of the United States, perhaps from Maine to Georgia, wherever the oaks which it prefers are found.

As the leaves are in full vigour in July, preparing the descending sap, and as the greatest part of the new wood is formed after the summer solstice, the loss of leaves at this season must diminish the tree's increase in diameter, in proportion to the quantity of leaves taken from it. But the falling of the branches with the larva in them enables us, though we cannot destroy the species, to check its ravages in some degree. The branches should be collected from the time they begin till they cease to fall, and carefully burnt.

* The upper lip is a kind of scale which covers the mandibles on the upper side; this is slightly notched, dotted, and fringed with hairs. The inner edge of the mandibles is curved, without notches, having a little within the edge a curved line set with short strong bristles. The maxillæ are divided at the outer end, the exterior division the largest, thin, and covered and fringed with hairs; the interior smaller, stronger, and terminated with thick-set curved bristles, forming a stiff brush at the base of the outer division of the maxillary palpi of four joints, the terminal joint largest, obliquely truncated and compressed. The lower lip is deeply divided into two parts, thin, rounded at the ends,

* This paragraph is slightly altered from the original, in which a plate is here referred to, not sufficiently well executed, however, to allow of our copying it.—EDIT.

covered and fringed with hairs; at the base of these divisions are the two labial palpi of three joints, the terminal one of the same shape as in the other pair, but smaller.

The plum-trees, *Prunus domestica*, have for a number of years been disfigured with irregular swellings on the younger branches. The seat of this disease is in the bark. The sap is diverted from its regular course, and is absorbed entirely by the bark, which is very much increased in thickness; the cuticle bursts, the swelling becomes irregular, and is formed into black lumps, with a cracked, uneven, granulated surface. The wood, besides being deprived of its nutriment, is very much compressed and the branch above the tumour perishes. The cherry-tree is affected in a similar manner.

When the Board of Trustees met at the seat of John Lowell, Esq. in Roxbury, on the 27th of June last, Mr. Pomroy took from a cherry-tree in Mr. Lowell's garden, a small branch diseased as above mentioned of the plum-tree. On taking off a thin slice of the tumour, I found it was inhabited by living larvæ; and flattered myself that the disease of both trees arose from the same insect. I brought the branch home with me, and placed it in a large glass phial. On the 6th of July, I perceived that the larvæ had left the tumour, and were uneasy in the bottom of the phial. A vessel of earth was immediately prepared, as mentioned above in the account of the Pruner; the larvæ when turned into it buried themselves instantly. On the 30th of the same month, or twenty-four days from their leaving the bark, the perfect insects began to rise. They proved to be insects which I had long known to occasion the fall of peaches, apricots, and plums, by the larva eating into the kernel of those fruits long before they had acquired half their growth.

This insect belongs to the same genus with the *Rhynchænus Strobi* or White Pine Weevil, described in the Massachusetts Agricultural Journal for January 1817, to a plate in which I would refer for a representation of the parts of the mouth. In that, the rostrum or snout is nearly straight; in the present species it is curved, so as to form the segment of a circle. All the thighs have two small obtuse points on the under side. In

colour it is variegated with white and red hairs; the ground colour of the shelly coat on which they are placed is dark brown. The thorax is contracted behind the head; its surface is irregular, much pitted, and has a raised longitudinal line in the middle, with three small tubercles on each side of it, placed in a triangular form. The elytra are marked with longitudinal ridges and on these are placed oblong tubercles, of which there are ten or twelve; four of these in the middle of the elytra are largest, smooth, and of a brown-black colour. On the under side the body is pitted, or marked, with large impressed points, like the top of a thimble. The first pair of feet is rather the largest; the second the smallest, and all are sprinkled with white and bright-rust-coloured hairs. The points of the claws on all the feet are double.

Mr. Pomroy was so obliging as to bring me three tumours cut from his plum-tree, later in the season, but the larvæ had left them. Being, therefore, uncertain whether the disease of the plum-tree is to be attributed to this insect or to another species of the same genus, I would call it the Cherry Weevil. It may be distinguished by the specific name of *Rhynchænus (Cerasi)*, femoribus dentatis; fulvo alboque variegatus, elytris tuberculis pluribus carinatis, quatuor in medio majoribus nigris.

Among the 272 species of this genus, mentioned by Fabricius, there were several found in Cayenne and Carolina, which are nearly allied to this; but it differs from them all, and appears to be undescribed.

The evil produced by this insect cannot be wholly remedied; but something may be done to diminish the mischief by cutting off the diseased branches. This however must be done at the right season, and must be the joint care of a whole neighbourhood at the same time. Those insects which furnished the data above set down, ceased to feed on the 6th of July, rose from the earth on the 30th, and were soon ready to deposit their eggs in healthy branches; but if the diseased branches be cut off in the last half of June, a great number may be destroyed, and most effectually, by burning the amputated parts. It is possible, that in some situations they may be disclosed earlier; it will therefore be

492 Mr. Yarrell on a *British specimen of Anas rufina*.

surest to prune away the diseased parts as soon as they appear, cleansing the tree now of the old tumours, that new ones may be more readily perceived.

ART. LIV. *Notice of the occurrence of a species of Duck new to the British Fauna. By WILLIAM YARRELL, Esq. F.L.S.*

SYNONYMES.

Anas Rufina.—Pallas.

The Great Red Headed Duck. — Willughby's Ornithology, page 364.

The Red Crested Duck.—Latham's General Synopsis, 1st Edit. Vol. VI. p. 544.

Canard Siffleur Huppé.—Temminck's Manuel d'Ornith. 2^e Edit. 2^e Partie. p. 864.

A male of this beautiful species was shot near Boston, while feeding on fresh-water in company with some Wigeons, and sent to the London Market, on the 21st January, from whence it was purchased for preservation.

Though a well known European species, it has not hitherto been recorded to have been killed in England.

As new therefore to the catalogue of British Ducks, a short description may be acceptable.

In size it is nearly equal to the common Wild Duck, (*Anas Boschas*), the irides and beak bright vermillion, the nails white, sides of the head and neck chesnut, but lighter in colour at the top of the head, where the feathers are elongated forming a crest, the nape and neck dark-brown, upper part of the back and scapularies light-brown, wing coverts ash-brown, a white semilunar patch over each shoulder, speculum white, shaft and part of each wing primary white, the edges and tips dusky, front of neck and breast dark-brown, abdomen lighter, under surface of the wings, sides and flanks white, all the white parts tinged with pink, tail feathers

ash-brown, upper and under tail coverts dark-brown, legs and toes orange, the webs black.

A doubt has been expressed that the occurrence of this bird might not be the result of natural migration, as several had been brought to this country, three or four years since: it may therefore be proper to state, that the plumage of the Duck now described did not exhibit any indication that the bird had been kept in confinement, and by a comparison with the plumage of the adult it will be found, that this is not yet arrived at maturity, probably in the second year, a circumstance very much in favour of a natural migration, our rare visitors being generally young birds.

It will also be recollected that the weather for ten days preceding its appearance was remarkable for the severity of the frost. Wild fowl were most abundant on our south and south-east coasts; young birds of all three species of the genus *Colymbus* were purchased in the London Market, and those of the genus *Mergus* in different states of plumage; British Ornithologists are also indebted to the pages of this Journal for the record, that within the last two years the *Oriolus Galbula*, *Anthus Richardi*, *Accentor Alpinus*, *Gallinula Baillonii* and others, have been taken in England, all of them birds extremely rare, and, compared with the Duck now described, of equal extent in their western migration.

W. Y.

ART. LV. *Description of a new Species of Astacus found in a Fossil State at Lyme Regis, in Dorsetshire, communicated by H. T. DE LA BECHE, Esq. F.R.S., &c. By G. B. SOWERBY, F.L.S., &c.*

ASTACUS longimanus.

A. manibus longis, centrali caudæ segmento utrinque subserrato.

Icon. Tab. nost. v. ii. t. xvii. fig. 1, 2.

A. with long hands and the central segment of the tail slightly serrated on each side.

The specimen from which our representation is taken was obligingly communicated by H. T. De la Beche, Esq., it is from the indurated nodules (called in the country "Cowstones") contained in the lowest green sand of Lyme Regis; it is in Miss E. Phillpot's collection.

The genus *Astacus* being divided, according to Desmarest, into two sections, the species of which are respectively inhabitants of the sea, (Lobsters) and rivers (Crayfish) the present species may be considered as belonging to the marine section.

Both the claws are rather rough: the superior external edge of the left hand has a longitudinal groove and the inner edge a few tubercular spines: the finger as well as that part of the thumb of the left hand opposite to it are armed with small, regular teeth on the inner edge; both are much attenuated and elongated. The right claw is more robust than the left: the outer edge of the thumb has a longitudinal groove, both above and below, and the inner edges of the finger as well as of its thumb are armed with a few large tubercles. The outer edges of the central segment of the terminal flap of the tail are serrated with a few small sharp teeth. Thorax with a few small pointed spines and a deep lunulate groove on each side in front; smooth and finely granulated behind. Abdomen smooth, with minute distant punctulations on the upper part. Terminal flap of the tail or abdomen rather rugose.

ART. LVI. *Descriptions of two new Species of Cypræa, principally extracted from "A Catalogue of the Shells in the Collection of the late Earl of Tankerville." By G. B. SOWERBY, F.L.S., &c.*

CYPRÆA UMBILICATA.

C. testâ oblongo-ovatâ, basi acuminatâ, supernè subrostratâ, umbilicatâ; dorso ventricosò, pallido, fusco-maculato; ventre subrotundato, albido; marginibus rotundatis, albidis, fusco-maculatis; aperturâ, dentibusque subdistantibus, pallidissimè subfuscis: long. $3\frac{1}{10}$ poll. lat. $2\frac{1}{10}$ poll.

Shell oblong-ovate, acuminated at its base; upper extremity (of the two lips) subrostrated; spire deeply pressed in or umbilicated, volutions apparent; back ventricose, pale coloured; spotted with brown; under part rather rounded, whitish; margins rounded, whitish, with brown spots; the aperture and the teeth, which are rather distant, very pale brownish: length $3\frac{1}{16}$ inches; breadth $2\frac{1}{16}$ inches.

Syn. *Cypræa umbilicata*, Sowerby, in Tankerville Catalogue, appendix p. xxx. No. 2260. cum Icon.

This singular Cowry, of which I have only seen two specimens, one in the Tankerville Collection and one in my own, neither of them in good condition, appears not to have been noticed by any author: it is principally distinguished by a deeply umbilicated spire; by the upper part of the aperture being produced and rather reflected and by its acuminated lower extremity: in general form it resembles a pear and its colour and markings are like those of some specimens of *C. Tigris*, of which, however, it cannot be considered a variety and from which it differs not only in the marks above mentioned, but also in the form and position of the teeth. I do not know its country.

CYPRÆA MELANOSTOMA.

C. testâ ovali, turgidâ, subfuscâ, transversè obsoletissimè brunneo-fasciatâ, guttulis elevatiusculis, niveis, conspersâ; ventre convexiusculo, extremitatibusque albidis, lateribus dorsalibus subincrassatis, utrâque extremitate subfoveolatis; dentibus labii externi mediocribus, interni minoribus, interstitiis fusco-violascentibus: long. $2\frac{3}{16}$ poll. lat. $1\frac{4}{16}$ poll.

Shell oval, swollen, subfuscous with rather darker transverse bands, sprinkled over with small, slightly elevated, snow-white spots; lower part slightly convex with whitish extremities; sides of the back rather thickened, with several small indentations near each extremity: teeth of the outer lip of moderate size, those of the inner lip smaller, their interstices of a dark violaceous brown colour. Length $2\frac{3}{16}$ inches, breadth $1\frac{4}{16}$ inch.

496 Mr. G. B. Sowerby on two new species of *Cypræa*.

Syn. *Cypræa melanostoma*, Leathes, M. S. ined. Sowerby in Tankerville Catalogue, appendix p. xxxi.

Icon. t. xviii. f. 3 et 4.

This Cowry, which as I have been informed, is found in the Red Sea, does not appear to be uncommon: we do not however find it described either by Dillwyn, Lamarck, or Gray. It has been mistaken for *C. Vitellus*, to which it approaches nearly in general appearance. It has, nevertheless, been long distinguished from that species by the late George Humphrey and by Mrs. Mawe: it may be known by its want of the arenaceous transverse lines so characteristic of *C. Vitellus*; the teeth on the inner lip are smaller than in that species and their interstices are of a dark violaceous brown colour: the teeth of the outer lip are larger than those of the inner: and the whole margin of the shell is whitish. In an incomplete state it is destitute of the pearly white specks on the back.

CYPRÆA GUTTATA. t. xviii. f. 1 et 2.

Two views of the only specimen of this shell known in this country are given in the 18th plate of the present volume of the Zoological Journal; the species being already described in the course of Mr. Gray's paper on *Cypræidæ*, (Zool. Journ. Vol. I. p. 511.) no further description is necessary. The figure will, moreover, give a very correct idea of this beautiful and valuable shell. I am indebted to Mr. Broderip for permission to draw it, and to Mr. Crouch for the execution of the whole plate, which he has obligingly presented to the Conductors.

ART. LVII. *On certain Organs of the Helicidæ usually regarded as their Eyes: with a summary of evidence in support of Aristotle's assertion that the Testaceous Mollusca are devoid of Visual Organs.* By E. W. BRAYLEY, jun. A.L.S.

[In a Letter addressed to G. B. Sowerby, Esq. F.L.S., &c.]

MY DEAR SIR,

THE REV. L. Guilding in a note to his amended generic character of the genus *Succinea*, forming a part of his *Mollusca Caribbæana*, inserted in the present number of the Zoological Journal, p. 442, expresses his opinion, that notwithstanding the curious remarks upon the subject of M. Gaspard,* “we may persist in calling the spots on the superior *tentacula* [of the animals constituting that genus] the eyes; though they are without doubt very imperfectly developed.” “These organs,” he adds, “situated at the very base of the feelers of *Limnæa*, *Helicina*, and other genera, cannot surely be considered as ‘organs of touch.’ In some marine *Mollusca* their structure is much more perfect.”

It occurred to me on reading this note, that an account of Mr. Bauer's microscopical examination of the larger *tentacula* of the Garden Snail, which adds much weight to M. Gaspard's statement derived chiefly from observation of the habits of the *Helices*, would form an appropriate notice for the Journal; and having been led to a cursory review of the opinions held by Naturalists respecting the nature of the organs in question, as possessed by certain groups of the *Gasteropoda* in general, in consequence of meeting with a passage bearing on the subject in the *Historia Animalium* of Aristotle; I beg to submit the results of my inquiry, through your hands, to the readers of the work. They may, perhaps, stimulate some student of practical Zoology, who is conveniently situated for the investigation, to elucidate some points in the physiology of the *Mollusca*, to which, although of much interest, but little attention has confessedly been directed.

* See Zool. Journ. Vol. I. p. 179.

And Mr. Guilding himself, probably, when he finds our present knowledge of the subject to be so scanty and so indecisive, may be induced to give it that further attention it so well deserves, and which he appears to be so well qualified to bestow upon it with success.

Sir Everard Home's Croonian Lecture on the Internal Structure of the Brain, published in the Philosophical Transactions for 1824, is illustrated, as most of his communications to the Royal Society have been of late, by a series of engravings from Mr. Bauer's exquisite microscopical drawings. In the present instance they represent the structure of the brain in the human subject, and, together with that of the nervous system, in animals of various classes. After considering the minute structure of the brain and nerves as they exist in several groups of the *Vertebrata*, the author proceeds to point out the peculiarities of those organs in Insects and Worms; and whilst thus treading upon the same ground on which Swammerdam preceded him, he awards a just tribute of praise to that great man, who, in many instances, has left nothing for those who follow him, but to bear testimony to the correctness of his representations and judgment. "There are some points however," Sir Everard observes, "in which he gave way to public opinion, and did not disbelieve what every one said must be true. I allude to his attempt to represent the eye of the Garden Snail at the point of the horn, which does not exist. He found black rete mucosum, which he mistook for nigrum pigmentum, and a pellucid part which he took for cornea. To shew this fallacy, I have annexed Mr. Bauer's representation of these parts. Swammerdam has given a faithful representation of the nerve, which might have undeceived him, it having no resemblance to other optic nerves, but being like those commonly met with going to tentacula." Accordingly, two figures by Mr. Bauer are given from the Garden Snail, both of which are in part copied in Plate xvii. On the first of these (fig. 3.) shewing the brain and nerves, as magnified four diameters, Sir Everard makes the following remarks:

"In this animal the brain is made up of two apparently equal portions. As the appearance at the termination of the two large

horns resembles eyes, and Swammerdam has attempted to delineate the different parts of the organs, Mr. Bauer has shewn the two nerves in different states. The medulla spinalis forms a larger mass than the brain, but equally made up of two distinct parts. From the upper edge of this mass, there is an azygos branch going directly upward to the muscles of the tongue, beyond which are the glands of the mouth, and the œsophagus cut through. This nerve, so similar to the recurrent in the human body, only differing in being single, justifies me in having given the name of spinal marrow to the part that gives it off."

Of the second figure, (Pl. xvii. fig. 4.) we have this explanation : "The point of one of the large horns, magnified fifty diameters ; to shew that the external point of its termination in no respect resembles a cornea, but consists of five bundles of nervous filaments, the terminations of the branches of the nerve."

I need scarcely point out the exact agreement of this statement of the nature of the extremities of the larger *tentacula* of the Snail, with that of M. Gaspard on the same subject, who, after recounting the experiments he instituted to ascertain the true nature of those organs, observes, "In a word, I find in these pretended optical bodies, nothing more than the organs of an exquisite sense of touch, with extreme sensibility to heat, dryness, moisture, to the slightest shock, or the least agitation of the air ; and this arises from a large nerve which is expanded over the extremity."

As no further account of Mr. Bauer's figures is given in the Philosophical Transactions, it may be useful to say a few words in explanation of them. In fig. 3, one of the *tentacula* appears to be represented, with the black point on the extremity, having a pellucid centre ; together with the nerve, and portions of the epidermis and black rete mucosum beneath it. The nerve and black point only of the other are shewn, the integuments having been dissected away. Fig. 4, represents, magnified fifty diameters, as above stated, the portion of rete mucosum, which, protruding from beneath the epidermis, forms the black point, mistaken by Swammerdam for nigrum pigmentum ; together with the nerve

rising through it, and expanding into the quinquedid pellucid termination, which he supposed to be the cornea.

The consideration of this curious subject brought to my recollection a passage I had read in some old author, in which Aristotle is said to affirm, that "Testaceous animals have no eyes;" and the accuracy which several modern Naturalists of the highest eminence have shewn many of that philosopher's generalizations to possess, seemed to render the statement worthy of verification and further inquiry. And upon referring accordingly to his History of Animals, I found the following notices on the point in question.

In Lib. I. cap. ix., where the Eyes are treated of in general, as they exist in man and in the lower animals, the Stagirite asserts that all animals have eyes, *with the exception of the Testacea*, and some other imperfect kind, and perhaps also of the Mole. "Habent perfectò oculos, tum cætera animalium genera omnia, præterquam testa intacta (*Οσσεακόδεγμα*), et si quid imperfectum aliud est:" &c.*

In Lib. IV. cap. i. the *Οσσεακόδεγμα* are identified with the true Testaceous *Mollusca*, and accurately distinguished from the *Cephalopoda* on the one hand and the *Crustacea* on the other, in the following manner: "Nunc ordinem animalium, quæ sanguine carent, persequemur. Genera in hoc ordine plura sunt. Primum, quæ mollia (*Μαλάκια*) appellavimus, hoc est quæ sanguine carent, et foris carne molli obducta, solidum intus, modo sanguinei generis continent: quale sepia est. Secundum, quæ crustis tenuibus (*Μαλακόστρακα*) operiuntur, hoc est, quæ partem solidam foris, mollem carnosamque intus continent. Durum illud eorum tegmen, non fragile, sed collisile est: quale cancrorum genus et locustarum. Tertium, quæ silicea testa conclusa (*Οσσεακόδεγμα*) muniuntur, hoc est quibus pars carnea intus, solida foris, fragilis atque ruptilis, non collisilis: quale genus concharum & ostrearum est."†

* Aristotelis Opera Omnia. Gr. & Lat. curâ Du Val. Tom. I. p. 769. Lutet. 1619. Fol.

† Ibid. p. 813.

Cap. iv. This chapter treats expressly and almost exclusively of the *Testacea*, and in it many animals of the group are mentioned or alluded to; but the visual organs are not even named, except indeed in the description of the *Καρκίνος*, which, the author says, partakes of the nature both of the *Μαλακίστρακα* and the *Οστρακόδερμα*: the eyes of this animal, which is evidently a *Pagurus*, he particularly mentions.*

In the eighth chapter of the same book, occupied by an account of the senses and their organs as possessed in general by the various primary groups of the Animal Kingdom, the *Testacea* are adverted to in these terms: “De visu et auditu quanquam nihil certi manifestique habemus, unguēs (Σωλήνες) tamen ad strepitum se subtrahere, inferiúsque subsidere cernuntur, quoties ferramentum sentiunt admoveri. Exiguo namque extant, reliquo autem toto corpore perinde ac in cubili, occuluntur. Pectines (Κτίς) quoque admoto digito dehiscunt, mox comprimunt se ut cernentes.”†

We will now proceed to the inquiry as to how far the implied assertion of the Father of Zoology in the first quotation given above, that the *Testacea* are devoid of eyes, and which the particulars respecting certain bivalves subsequently related, cannot, I think, be considered as contradicting, agrees with the statements of modern science.

Of the six classes into which the *Mollusca* have been divided by Cuvier, we may at once dismiss from the inquiry the first, or the *Cephalopoda*; and that without having recourse to the distinction between those animals and the true *Mollusca*, which has been established by Mr. W. S. Macleay; for we have seen that Aristotle himself distinguishes them from his *Οστρακόδερμα*. The animals constituting three of the remaining classes,—the *Acephala*, comprehending the greater part of the Bivalves, the *Brachiopoda*, comprising the remainder of them, and the *Cirripeda*, which include the various species of *Lepas*, Linn.,—are all well known to be devoid of eyes. The only classes, then, with which we are at present concerned, are the *Pteropoda* and the *Gasteropoda*.

* Ibid. p. 821.

† Ibid. p. 828.

With respect to the first of these classes, it appears to be a matter of great doubt whether they possess even the minute organs, which, in the *Gasteropoda*, have usually been regarded as organs of sight. For Cuvier, though he states, in the first instance, that a part only of the *Pteropoda* are devoid of eyes,* yet, in his particular description of the class, he merely says that some writers have assigned eyes to the animals of the genus *Clio*,† and does not again allude to the subject. And Dr. Fleming, in his excellent *Philosophy of Zoology*, informs us, that the *Pteropoda* “are generally regarded as destitute of eyes and ears.”‡ Lamarck, indeed, enumerates “*oculi duo*” among the characters of his genera *Cleodora* and *Cymbulia*;§ but from a remark he subsequently makes, and which will presently be quoted, we may fairly infer, I think, that the organs he so denominates are similar to those of the *Gasteropodous Mollusca*; which I shall next proceed to shew, on the authority of Messrs. Gaspard and Bauer, as well as on that of a modern Zoologist of the first reputation, are to be regarded, in all probability, not as organs of sight, but of delicate touch.

We see then, that, in the present state of science, the only division of the *Mollusca* from which any decided instances can be adduced, in opposition to the statement of the Grecian naturalist, of testaceous animals possessing even the organs *supposed* to be eyes, is the *Gasteropoda*; the inquiry being thus confined within very narrow limits.

The minute organs, appearing to the unassisted eye merely as black points, which are possessed by certain groups of the *Gasteropodous Mollusca*, a class including the greater number of the animals that inhabit univalve shells, and which are commonly attached to their *tentacula*, have been conjecturally stated by some systematic naturalists to be organs of vision; whilst others have doubted this, and considered them rather as organs of touch; but none appear to have subjected the living animals or their supposed eyes, to a strict and decisive examination, with the view to determine the truth. Hence we find in the works even

* Règne Animal, tom. II. p. 354. † Ibid. p. 379. ‡ Phil. of Zool. vol. II. p. 441. § Anim. sans Vertèb. tom. VI. p. 289, 292.

of comparative anatomists, and of those naturalists who are most conversant with the anatomy and physiology of the *Mollusca*, but very imperfect and vague information on the subject. Thus Dr. Fyfe, in his *Outlines of Comparative Anatomy*, p. 312, remarks, when describing the organs in question, "it is not yet fully ascertained whether these parts are real organs of vision." Cuvier seems to take it for granted they are eyes, without offering any evidence to verify that admission ;* and Lamarck does the same, but he qualifies the statement, by observing, after mentioning the conformity of the eyes of the *Cephalopoda* to those of the Vertebrated animals, "les autres mollusques, parmi ceux qui en sont munis [d'yeux], ont les leurs fort imparfaits, peu propres à l'usage de la vue, et presque uniquement tentaculaires, c'est-à-dire, plus sensibles ou irritables au contact des corps concrets qu'à celui de la lumière."† Dr. Fleming gives the following account of the subject : " Among the Gasteropodous *Mollusca*, the eye is too minute to admit of accurate dissection. It appears as a black spot, convex, however, on the surface, and furnished with a nerve from the cerebral portion of the brain." *Phil. of Zool.* vol. I. p. 181.—" In a few species [of *Mollusca*] the eye is constructed on the plan of the same organ in the vertebral animals. In general, however, it appears only as a black point, the peculiar functions of which can only be inferred from analogy." *Ib.* vol. II. p. 409.

Mr. W. S. Macleay, indeed, as might have been expected, from the importance he assigns to variation of characters, in determining the station in nature of a group of organized beings, as well as to the adaptation of their structure to their respective functions in creation, assumes a more decided tone of opinion on the subject. When alluding to the senses of the *Mollusca*, in the chapter on the classes of the animal kingdom, in his *Horæ Entomologicæ*, p. 248, he observes, "The senses of the *Mollusca* seem to be confined solely to those of taste and touch, though Cuvier supposes them to be also able to smell. The black points which have attained the name of eyes, seem to serve less for sight than

* Règne Animal, tom. II. p. 382.

† Anim. sans Vertèb. tom. VI. p. 272.

for touch ; at least they display little if any sensibility of the presence of light, while their existence obviously increases the irritability of the tentacula as organs of touch." And whilst explaining the passage from the *Invertebrata* to the *Vertebrata* by means of the *Mollusca* and the *Cephalopoda*, in the next page, prior to adverting to the senses of sight and hearing as indubitably possessed by the latter group of animals, he makes this additional remark : " Hitherto we have seen but few animals endowed with the organs of sight ; and when the eyes existed, or rather when we supposed these organs to exist, we have found them merely black points, affording no trace of that peculiar organization which we are led from analogy to conceive necessary for the purpose of vision." In both places, however, it will be observed, (and no circumstance could have better shewn our deficiency in actual knowledge upon the subject,) that even Mr. Macleay has employed terms indicative rather of doubt than of certainty : but lest any one should imagine, on the other hand, that although the conflicting and vague evidence of previous writers might have induced some degree of hesitation in Mr. M's mind, yet that the fact he records of the black points being devoid of the organization necessary for the purpose of vision, must have removed all doubts from the minds of subsequent describers of the *Mollusca*, I shall terminate my citations with an extract or two from one of the latest and most elaborate general works upon them ; the " Histoire Naturelle des Mollusques Terrestres et Fluviales," by the Baron de Ferussac.

In the Supplement to the history of the *Limaces* in this work, the author gives a minute account of the anatomy of the *Vaginulus Taunaisii*, communicated to him by M. De Blainville ; and as it is manifest that the ocular (*sic dicta*) points of the naked and the testaceous *Mollusca* are of precisely the same nature, an extract from this eminent comparative anatomist's description of the *tentacula* of that animal, will serve to shew his views on the subject immediately before us. " Je n'ai pas fait," he says, " l'anatomie de l'œil ou point noir qui se trouve porté à l'extrémité des tentacules postérieurs ; j'ai seulement remarqué qu'il est fort sensible, et qu'il est placé à la face dorsale d'une sorte de petit renflement

aplati et lisse qui termine ce tentacule, et non pas à sa pointe. Ce n'est qu'au-delà de ce renflement que commencent les plis transversaux du reste de cet organe." And in the explanation of the accompanying plate of dissections, he calls the nerves that supply the extremities of the *tentacula*, the *optic nerves*, as usual.

M. de Ferussac himself, in his general account of the *Pulmonifera* without an operculum, gives the following observations on the functions of the *tentacula* and eyes in the terrestrial and fluviatile species; from which his belief that these enigmatic organs are in reality *Eyes*, is manifest.

"Généralement les pulmonés terrestres sont pourvus de quatre tentacules cylindriques, renflés à leurs sommets, les deux supérieurs et plus longs paroissent spécialement destinés à porter les yeux plus ou moins en avant de la tête de l'animal, comme deux sentinelles vigilantes chargées d'éclairer ses mouvements. Si l'on réfléchit aux habitudes, à la manière de vivre de ces animaux on verra qu'exposés à une foule d'ennemis, à mille chocs, à beaucoup de mutilations accidentelles, il leur étoit plus nécessaire qu'aux espèces fluviatiles d'avoir des yeux très avancés et organisés de manière à pouvoir se porter de tous les côtés pour découvrir le danger; placés au bout d'un tube en quelque façon comme l'objectif d'une lunette, ces organes auroient été par cela même souvent exposés à ces mutilations dont ils doivent garantir le corps, si le mécanisme de leur rétraction ne les en eût préservés.

"Dans les pulmonés fluviatiles on ne trouve jamais que deux tentacules toujours contractiles; ils sont subulés, linéaires, ou triangulaires et aplatis; les yeux sont situés à leurs bases internes presque toujours. Le séjour de ces mollusques dans l'eau, qui peut être troublée par mille causes et rendre ainsi leur vue inutile, doit naturellement nécessiter la supériorité du sens du tact pour préserver ces animaux; aussi celui de la vue lui paroît-il subordonné. Les yeux fixés sur la tête semblent plus spécialement destinés à avertir l'animal des dangers qu'il peut courir vers cette partie, et des corps étrangers qui pourroient s'introduire entre le cou et la tunique qui tapisse le test, cette cavité n'étant point fermée comme dans les espèces terrestres par un collier qui entoure le cou jusqu'au bord de l'ouverture de la coquille. Ces

tentacules très irritables présentent une large surface ou un filet si délié qu'ils doivent percevoir les plus légères impressions, mais toujours dirigés en avant ils ne pourroient avertir l'animal du danger qu'il coure par derrière, où pour cette raison les yeux sont placés. Il n'eût pas été prudent d'ailleurs de mettre les yeux aux sommets des tentacules chez des mollusques, beaucoup plus exposés encore que les terrestres aux mutilations accidentelles."

Having now shewn the general state of opinion on this subject, by the foregoing quotations from the works of some of the most eminent naturalists, I shall hasten to conclude this article, which may perhaps already have appeared tedious to some of your readers, by the inferences I am disposed to draw from the whole of the evidence before us.

The general remark of Aristotle in the passage quoted from lib. iv. cap. viii. of his History of Animals, respecting the senses of sight and hearing in the *Testacea*, and the account which is annexed to it of some of the habits of certain bivalves, must not be considered, I think, as in any degree contradicting his previous statement, that those animals are destitute of Eyes. For, although the actions of the Bivalves alluded to might appear to furnish some ground for such contradiction, (did we not certainly know that the classes of *Mollusca* which construct Bivalve shells are absolutely devoid of the sense of vision,) yet Aristotle refrains from drawing such an inference; but seems rather to bring forward the instances as remarkable facts, connected with the subjects he is investigating, though not affording positive information concerning them.

I have already observed that the *Gasteropoda* appear to be the only class of *Mollusca* from which even a hypothetical contradiction of the Stagirite's assertion can be derived;—that they are the only true *Mollusca* stated to enjoy the sense of vision. But what do we find to be the state of science respecting what are deemed their organs of sight? Why, that some naturalists, without giving any reasons for their belief, affirm them to be Eyes; that some merely suspect them to be Eyes; that others, again, appear to suspect they are not Eyes: but that none have advanced any direct evidence on either side;—if we except Mr.

Macleay's bare assertion, that the "ocular points" are devoid of the organization requisite to produce vision.

Now, as these organs, whatever they may be, are manifestly of the same nature throughout the various groups of animals possessing them; and as we cannot, I submit, refuse to credit the conjoint evidence, derived from two very different modes of research, of M. Gaspard and Mr. Bauer, that the organs which crown the larger *tentacula* of the *Helices* are not *Eyes*, but organs of an exquisite sense of feeling;—may we not conclude that the case is the same with all the *Gasteropoda* provided with those organs, placed either on their *tentacula* or directly on their heads? And may we not refer the assertion of the naturalist of antiquity which we have made the subject of inquiry, to those sagacious generalizations, for which his works are now so deservedly esteemed by naturalists?

These organs appear to supply the place of hearing as well as of sight to the animals, and perhaps also that of smell. The indefinite language which is employed by M. Lamarck, and by some other writers, when describing them, is unworthy of Science: they may, possibly, have some kind of sensibility of the action of light; but if they do not possess the peculiar structure necessary to impart to the animals the sensations, either of the colours of outward objects, or of their forms, as manifested by the variations of light and shade, to call them *Eyes* is a contradiction in terms.*

* May I be permitted to suggest a hypothetical idea or two on this subject?

May not these delicate nervous organs of some of the *Gasteropoda* and *Annelides* correspond to the true Eyes and Ears of animals higher in the scale of animated nature; analogically representing both, and performing the functions of both, in the degree required by the natural exigencies of the animals? As M. Gaspard informs us, that, in the Snail, they have extreme sensibility of the least agitation of the air, is it not probable, that, though not adapted to convey the sensation of *sound*, they may carry a perception to the *sensorium* of the animal, of those *vibrations of the air* which impart that sensation to the more perfect organs of the higher animals? And, though not provided with the exquisite and complicated mechanism, necessary to produce the varied sensations of light and shade, and of colour, is it unphilosophical to infer, that they may, in like manner, convey a perception of the *undulations of the luminiferous ether*, which, (adopting the Huygenian undulatory theory of light as revived and explained by Dr. T. Young), enable those animals which possess, true

M. de Ferussac's acute remarks on the difference of position in these organs, as borne by the terrestrial and the fluviatile *Pulmonifera*, will apply to them with equal truth, when they are considered, not as organs of sight, but as the organs of a delicate sense of *feeling*, distinct from the ordinary *touch* adapted to the examination of concrete substances. And, with this construction, his reasoning on the subject disarms the objection to M. Gaspard's statement, which Mr. Guilding derives from the situation of the black points "at the very base of the feelers of *Limnæa*, and *Helicina*;" with regard, at least, to the former genus, which is known to be an inhabitant of the waters. The marine *Mollusca* alluded to by Mr. G. are doubtless *Cephalopoda*, and as such the perfect structure of their eyes has no bearing on the subject before us.

As Aristotle expressly classes the *ὀρεακόδεμα* as exsanguineous animals, (*quasi* animals devoid of *red blood*;) it is not probable that he confounded with them the testaceous *Annelides*; but even if this was the case, his assertion will still hold good, for the latter are admitted to be devoid of sight; and the other groups of the same class have only the equivocal black points of the *Gasteropoda*.

In concluding this hasty sketch of so interesting a subject, I must unaffectedly acknowledge my sense of its imperfect and unsatisfactory nature; and this acknowledgment demands a statement of my reasons, for presenting it to the readers of this Journal. Those reasons were as follows: finding so important a part of the history of the *Mollusca* enveloped in an obscurity, which was unlikely, it appeared, soon to be dispelled, I considered, that though I should be unable, from other and pressing avocations, to give the matter the full elucidation it deserved, yet, that I might, by exhibiting the present state of science regarding it, contribute in some small degree to the advancement of

Eyes to enjoy the sense of vision? To beings occupying so low a rank in the Animal Kingdom as the *Mollusca* and the *Annelides*, nothing more, probably, is requisite, than the *sense* of the *presence* of sound and of light, for their security or their enjoyment; which they would receive by these means as effectually, as if they were enabled to hear and to see.

Zoology; by attracting to the subject the attention of those naturalists, who might be qualified, and at liberty, to determine the points at issue, by a train of exact researches.

I wished also to be an auxiliary, in the work of rescuing the natural science of the Peripatetic sage, from the neglect and obloquy, with which the cultivators of the Baconian philosophy, in their just zeal for discarding some of the forms of empirical ratiocination, attributed to Aristotle, have inadvertently and undeservedly regarded his physical treatises. In this work, many distinguished naturalists are now engaged; it has already been aided in the pages of the Zoological Journal; and if in the above character I am allowed to serve, under the banners of a Cuvier, a Ferussac, and a Macleay, I shall be amply rewarded for my slight exertions in the cause.

I remain, &c.

E. W. BRAYLEY, jun.

70, Hatton Garden, Feb. 10th, 1826.

P. S. On looking through a volume of the Philosophical Magazine, since the proof of the foregoing paper was corrected for the press, my eye glanced on a passage in a memoir on the Eyes of Insects, by M. Marcel de Serres, in which they are said to be "constructed so as to receive the images of objects by the simple shock of the rays which these objects reflect;" a supposition very similar to that which I have advanced in the note at p. 507, in explanation of what appears to be the analogue of sight in the *Gasteropoda*, &c.; except that M. de Serres seems to adopt, in this instance, the Newtonian or corpuscular theory of light. However, after attentively perusing his elaborate memoir, and comparing it with what Swammerdam and Cuvier have detailed on the same subjects, I think we shall be justified in concluding, that this theory, as far as regards Insects, is unfounded. It also appears to me, that the structure of their eyes, as described by M. de Serres, when illustrated by the light Dr. Wollaston has recently thrown on the long agitated question of single vision with two eyes, furnishes strong grounds for believing, contrary to what has hitherto been supposed, that the means by which vision is effected in Insects, and in the Vertebrated Animals, are essentially the same.

Whilst pursuing this subject, I have found that Messrs. Kirby and Spence, in one of the concluding volumes, just published, of their Introduction to Entomology, have expressed an idea on the sense of hearing, or its analogue, in Insects, identical with that which I have suggested on the analogue of hearing in the *Gasteropoda*; and that they have furnished some evidence on its behalf, which tends also to give validity to my supposition.

Time will not allow of my entering further into these subjects, at present; but I shall prepare an article on both of them, for the next number of the Journal.

March 11th, 1826.

E. W. B.

ART. LVIII. *Descriptions of some rare, interesting, or hitherto uncharacterized Subjects in Zoology. By N.A. VIGORS, jun. Esq. M.A., F.R., L. & G.S.; with Figures by J. DE CARLE SOWERBY, Esq. F.L.S.*

Subregnum.	ANNULOSA. MacL.
Classis.	MANDIBULATA. MacL.
Ordo.	COLEOPTERA. Linn.
Tribus.	LAMELLICORNES. Latr.
Stirps.	PETALOCERA SAPROPHAGA. MacL.
Fam.	SCARABÆIDÆ. MacL.
Genus.	ANAMNESIS.

Antennæ novem-articulatæ; articulis, primo longissimo ad apicem crassiori, secundo brevi subgloboso, tertio et quarto longioribus obconicis, quinto et sexto pateriformibus, hoc ad apicem latissimo, septimo octavo et nono subsimilibus capitulum ovalem subelongatum efformantibus.

Clypeus rhomboideus, subtrilobus, lobo medio subobtusé bidentato.

Thorax transversus, sublunularis, posticé vix angulatus.

Coleoptra subelongata, thorace plus quam duplo longiora, latitudinem longitudine æquante; *elytris* clausis subcordiformibus;

marginibus externis profundé deorsum intusque inclinantibus, angulum acutum formantibus, abdominisque partem circumcingentibus.

Pedes graciles: *coxis* intermediis a se distantibus. *Tibiæ* anticae extus quadridentatae, dentibus subelongatis subacutis; et quinque tuberculis brevibus subobtusis subdentiformibus prope basin extus, duobusque inter dentes primum et secundum subacutioribus, instructae; tarsis nullis. *Tibiæ* intermediæ tetragonae, graciles, subarcuatae, longitudine mediocres, integrae, duobus calcaribus ad apicem instructae; tarsis subfortibus, unguibus debilibus. *Tibiæ* posticae elongatae, calcare uno instructae, in cæteris intermediis similes.

Corpus supra depressissimum; *abdomine* subtus convexo.

Obs. *Instrumenta cibaria*, individuum exemplum generis solum habens, haud dissecui ritè examinavi.

The family of *Scarabæidæ* as characterized by Mr. MacLeay in his "Horæ Entomologicæ" appears divisible into five chief groups; of which the genera *Scarabæus*, MacL., *Copris*, Ill., *Phanæus*, MacL., *Onthophagus*, Latr., and the remaining portion of the genus *Ateuchus*, Weber, which does not possess those characters that have separated the true *Scarabæi*, MacL., from that genus, may be selected as the representatives. To this latter group of *Ateuchus*, thus curtailed, the present form appertains: and it may probably be found to be the typical representative of the group. At least it partakes to so great a degree of the characters of each of the above well known genera *Scarabæus* and *Copris*, that it may be chosen as an appropriate example of the fifth group of the *Scarabæidæ*, MacL., intervening between and connecting those two groups, and of equal value with them. It bears an evident relation of affinity to the former genus by its depressed form and elongated and slender hinder *tibiæ*, and at the same time asserts its affinity to the latter by the wide separation of the medial *coxæ*, and the double spur on the *tibiæ* of the middle legs.

The group of *Anamnesis* is of equal value in respect to the larger group of *Ateuchus*, with that which *Heliocantharus*, MacL.,

Pachysoma, Kirby, *Gymnopleurus*, Ill., &c. bear to *Scarabæus*, MacL. These subdivisions of *Scarabæus* are stiled *types of form* or *subgenera* by Mr. MacLeay. I must confess I feel much repugnance to the interposition between genera and species, of any intermediate groups which are distinguished by scientific characters and separate names. Considerable confusion inevitably arises between the generick and subgenerick name: and the great advantage of simplicity and uniformity in nomenclature is lost by a species having two separate denominations besides its own specific name by which it may be indiscriminately referred to. The groups of *Heliocantharus*, *Pachysoma*, &c. appear to me to possess the rank of genera, in the usual and practical acceptation of the term; and the more extended groups of *Scarabæus*, *Ateuchus*, &c. seem to demand appellations of a more comprehensive nature than that of genera. Such indeed is the usual and natural progress of our science. As forms and species encrease in number, the subdivisions which are made for their reception must bear a proportional increase in their rank and value. But this is not the place to enlarge upon this subject: nor do I wish to discuss a point upon which I feel much diffidence in hazarding an opinion which is at variance with such high authority, unless I had more time than I can at present spare for entering fully upon the subject. I merely refer to the subject in order to point out the relative importance of the group before us, which I conceive to be of equal rank with Mr. MacLeay's *types of form*.

I have seen but one species which accurately accords with the typical characters of this group, and which I received from South America. There are some species from the same quarter nearly allied to it, such as *Ateuchus gibbosus*, Fab., &c. but the body in those insects is by no means so depressed as in the present.

MACLEAYII. *Anamn. ater*, antennarum capitulo subtus rufescenti; clypeo thoraceque punctis impressis; clytris rugis elevatis irregularibus inter sex sulcos ferè obsoletos, carinisque duabus elevatis, alterâque subobsoletâ, longitudinalibus, interruptis, ad latera instructis.

Tab. xix. f. 1.

Anamnesis MacLeayii, and Cetonia Stephensii. 513

Longitudo corp. l $\frac{7}{8}$; lat. $\frac{9}{16}$.

Habitat in Brasiliâ.

In Mus. nost.

Viri amicissimi GULIELMI SHARPE MACLEAY, Armigeri, Artium Magistri, Societatis Linneanæ Socii, "Horum Entomologiarum" celeberrimi auctoris,—nunc apud Novæ Orbis oras in causâ Scientiæ simul ac Humanitatis feliciter versantis, at heu! pro societatis amœnitatibus nimis longé distantis,—hoc insectum, ad familiam pertinens quam ingenio summo diligentiaque nunquam satis laudandâ illustravit, nomine designatum, amicitiae pignus et RECORDATIO fiat.

Stirps. PETALOCERA THALEROPHAGA. MacL.

FAM. CETONIADÆ. MacL.

Genus. CETONIA. Fab.

STEPHENSII. *Cet. vividè viridis; capite duabus, thorace quatuor lineis longitudinalibus albis; elytris lineis duabus longitudinalibus humeralibus, sex fasciis interruptis undulatis apicalibus, maculæque ad apicem suturalem, albis.*

Tab. xix. f. 2.

Caput, thorax, elytraque punctis parcè nec profundè impressi; horum punctis in lineas longitudinales subinconspicuas seriatim dispositis. Abdomen subtus album pilis albis aspersum, segmentis omnibus, primo duobusque ultimis exceptis, maculâ triangulari in medio, alterâque quadratâ ad latus utrumque, viridibus notatis: primo maculâ viridi in medio quadratâ; penultimo strigâ mediâ margineque inferiore viridi; ultimo strigâ latiore mediâ margineque superiore viridi, ad marginem inferiorem albo-ciliato. Abdominis superioris segmentum ultimum viride, punctis parcè impressum, strigis albis quatuor, duabus mediis alterâque utrinque marginali ornatum; strigâ mediâ utrâque marginalique conterminali ad apicem abdominis ferè confluentibus. Pectus in medio viride, ad latera album, pilis sublongis albis obtectum. Pedes punctis impressi, subtus albo-ciliati: femoribus subtus albo-stri-

514 Mr. Vigors, on some new subjects of Zoology.

gatis, pilisque albis instructis; *tibiis* strigâ interruptâ albâ supernè notatis.

Longitudo corp. $\frac{1}{2}$; lat. $\frac{1}{4}$.

Habitat in Africâ meridionali.

In Mus. Dom. Bennett, nost.

In honorem JACOBI FRANCISCI STEPHENS, Armigeri, Societatis Linneanæ Socii, Entomologiæ Britannicæ seduli felicissimique indagatoris, hoc perpulchrum insectum nominatur.

Tribus. STERNOXES. Latr.

Fam. BUPRESTIDÆ. MacL.

Genus. BUPRESTIS. Linn.

LYONII. *Bup. viridis aureo nitens; capite thorace elytrisque punctis profundè impressis, horum punctis lineatim dispositis.*

Tab. XIX. f. 3.

Elytra sulcis rugosis punctisque lineatim dispositis longitudinaliter notata: marginibus subrecurvis aureo-splendentibus. *Corpus* subtus *pedesque* punctis irregulariter impressi, pilis ferrugineis parvis instructi.

Longitudo * corp. $1 \frac{1}{2}$; lat. $\frac{2}{3}$.

Habitat in Barbariâ.

In Mus. Dom. MacLeay, Kirby, Horsfield, Bennett, nost.

Peregrinatoris indefessi, intrepidi, oculatissimi, JACOBI LYON, classis regiæ Navarchi, qui insectis plurimis a se in Africâ interiori collectis scientiam ditavit, hæc species nomen mutuatur.

Tribus. CAPRICORNES. Latr.

Fam. PRIONIDÆ.

Genus. DORYSTHENES.

Antennæ duodecim-articulatæ, compressæ, subtus serratæ: articulo primo elongato subcylindrico ad apicem crassiore, se-

* This species varies considerably in its dimensions: the above is the largest in size that I have met with. I have an example in my collection measuring $\frac{1}{2}$ only of an inch in length, and $\frac{1}{3}$ in breadth.

cundo brevissimo subhæmisphærico, tertio longissimo subcylindrico, cæteris ad penultimam inclusam gradatim breviscentibus subtrigonis apice cyathiformibus, ultimo subelongato, processu ovali brevi, tridecimum articulum ferè repræsentante, ad apicem instructo.

Mandibulæ graciles, porrectæ, subelongatæ, ad basin tuberculo subeminenti, denteque parvo acuto instructæ, per reliquam longitudinem inermes, subtrigonæ, intus incisoriæ, compressissimæ, paululum arcuatæ.

Palpi maxillares quadriarticulati; articulis tribus primis subcylindricis subcompressis apice crassioribus, primo et tertio ferè æqualibus subbrevis, secundo longiori, quartâ securiformi: labiales triarticulati; articulis duobus primis subcylindricis subcompressis apice crassioribus, primo subbrevis, secundo longiori, tertio subbrevis securiformi.

Pedes mediocres, *femoribus tibiisque* valde compressis.

Corpus subelongatum, subcylindricum. *Collum* productum. *Thorax* subrhomboideus, ad latera unidentatus, marginibus acutis compressis. *Sternum* forte, in spinam validam productum.

This form stands conspicuously distinct from any other that I have hitherto observed in the family of *Prionidæ*. Its somewhat lengthened and subcylindrick body, its elongated neck, its slender porrected and unarmed mandibles, and above all its armed *sternum*, produced into a strong and acute spine, offer characters which call for a separate station and title in the family. The *Prionidæ* are at present in such confusion, little having been done to subdivide or regulate the various and strongly marked groups which are still included in the genus *Prionus*, that it is impossible at present to point out the affinities of *Dorysthenes*, or to ascertain its relative station in the family.

I have seen but one species that accords with the above characters, which although a well known Fabrician species, and figured by Olivier, I think of sufficient interest from its peculiarity of form, and also its scarcity, to have figured in this journal.

516 *Rev. Mr. Kirby, on Cremastocheilus and Priocera.*

ROSTRATUS. *Dor. brunneus, palpis, antennarum articulis ultimis, thorace, tarsis, corpore pedibusque subtus rufis; capite mandibulisque nigris.*

Tab. XIX. f. 4. sternum productum. 5 a.

Prionus rostratus. Fab. Ent. Syst. I. pars 2. p. 243. 3.

Prione a bec. Oliv. Ins. No. 3. IV. 36. No. 42. t. 10. f. 37.

Long. corp. 1 $\frac{1}{4}$; lat. $\frac{1}{3}$.

Habitat in Maderaspatanâ; in Siam secundum clarissimum Fabricium.

In Mus. Britannico, Banksiano, Dôm. Haworth, nost.

ART. LIX. *A Description of two new species of Coleopterous Insects belonging to the genera Cremastocheilus and Priocera. By the Rev. WILLIAM KIRBY, F.R.S. & L.S. &c.*

It is always a satisfactory confirmation of a genus, of which only a single species has hitherto been known, to discover a new one. As therefore I possess several insects of this description, I may render some service to science, if by means of the Zoological Journal, I make Entomologists acquainted with them. On the present occasion I have selected two, one belonging to a most remarkable genus related to *Trichius* F., distinguished by the very singular form of its *Labium*, and called by Knoch, who first laid down its characters, *Cremastocheilus*, and the other to a genus I have described in the *Linnean Transactions*, under the name of *Priocera*.

CREMASTOCHEILUS Knoch, Latreille.*

VARIOLOSUS. *C. niger, obscurus, clytris variolosis: prothorace toto punctato.*

* *Neu Beytrag. Insect. 115. t. 3.*

Long. corp. Lin. 4½.

REGIO. America Septentrionalis? *Ex. Mus. D. Francillon.*

DESCR. *Labium* pelviforme, subrhomboidale, posticè emarginatum sed minus profundè. *Thorax* punctatus, angulis prominentibus tuberculiformibus lævibus. *Elytra* apice gibba, variolosa: variolis oblongis, distinctis.

Dr. Thaddeus Harris having obligingly sent me another insect as the *Cremastocheilus Castaneæ* of Knoch, which differs from M. Latreille's * short definition of that species in not being hairy, except somewhat underneath; it may be useful to give a more detailed description of it.

CASTANÆ. *C. niger, nitidus, punctatus: prothorace anticè lævi, utrinque trifoveato: elytris confluentèr punctatis.*

Long. Corp. Lin. 5½.

REGIO. America Septentrionalis.

DESCR. *Corpus* subdepressum, oblongum, nigrum vel piceo-nigrum, nitidum, subtus albido-subpilosum. *Caput* posticè punctatum, anticè naso dilatato, reflexo. *Rhinarium* sub naso latitans fere lunatum. *Labrum* brevissimum, emarginatum, cum labio os exactissimè claudens. *Labium* pelviforme, subrotundum, posticè profundius emarginatum et pilis ciliatum. *Prothorax* subquadratus angulis prominentibus tuberculiformibus, posticè punctatus anticè lævigatus, utrinque foveis tribus: primo nempe baseos magno punctato, secundo intermedio profundo, tertio anguli antiqui minori, his ultimis lævigatis. Fasciculus pilorum albidorum prothoraceus posticè utrinque signat. *Scutellum* magnum, triangulare, acuminatum, punctatum. *Elytra* basi, humeris, apiceque gibbis, punctis magnitudine et formâ variis confluentibus, setulis albidis decumbentibus inspersa.

Whether this specimen is rubbed I cannot say, but the two little bunches of hair in the thorax correspond in size and situa-

* *N. Dict. D'Hist. Nat.* viii. 420.

tion with each other. Having no opportunity of consulting Knoch, I know not whether he has given a detailed description of his species, or whether it is really synonymous with this.

PRIOCERA. Kirby.*

PUSILLA. *P. subvillosa rufa: elytris punctato-striatis apice lævis; utroque fasciâ nigricanti punctisque duobus flavis.*

Long. Corp. Lin. 2½.

REGIO. America Septentrionalis? *Ex Mus. D. Francillon.*

DESCR. Structura et Habitus *P. variegati*, sed multoties minor, et tota rufa, capite prothoraceque rubescentibus. *Elytra* punctato-striata apice lævia. Fascia irregularis nigro-picea, et puncta duo flava in medio obliquè ordinata *elytrum* utrumque signant. *Tarsorum* pulvilli subinvoluti.

ART. LX. *Additions and Corrections to Mr. VIGORS's Sketches in Zoology.*

VOL. I. p. 313.—“*Stirpes.*” This term, which I at first used as designating the immediately subordinate subdivisions of a family, had been previously employed by Mr. MacLeay, as representing a group of higher value than that of a family. I have consequently altered the term, in my subsequent sketches, into that of *Subfamily*. The *Stirpes* therefore of the *Falconidæ* should be considered the subfamilies of that group.

VOL. I. p. 327.—“*Genus Harpagus.*”—The general want of communication between the naturalists of this country and those of the continent, has given rise to the multiplication of synonyms, not merely in the case of species, but in that of groups. Employed at the same time upon the same subjects, it is almost impossible that we can steer clear of each other's researches in this respect: and unfortunately it is not always in our power to determine the priority of the names thus respectively con-

* *Linn. Trans.* xii. 389, 392. Plate xxi. fig. 7.

ferred upon the same groups. In Brazilian and Javanese Zoology this is the case to a very great extent; more particularly with respect to the Zoology of the former country, from whence a vast accession of new subjects has lately poured into every part of Europe. The above Brazilian genus, which I characterized in the former volume of this Journal, is one of those forms which has been considered by continental naturalists worthy of being separated into a distinct group; and it forms the genus *Bidens* of Dr. Spix, as published in his splendid work on Brazilian Ornithology. In this case however there can arise but little confusion as to the adoption of the generick name for the group; that of *Bidens* having long since been appropriated to Botany: it is in fact a Linnean genus.

The same observations may be made respecting the group of *Psittacara*, characterized at Vol. II. p. 388, of this Journal. The species which compose that group have been referred to a new genus of that gentleman, under the name of *Aratinga*. Here again we may easily reconcile the apparent clashing of these two names. My group extends only to the South American species of *Parrakeets*, the orbits of whose eyes and a greater or less extent of whose cheeks is naked: while *Aratinga* not only embraces these, but includes a considerable number of the long-tailed *Parrakeets*, which have the cheeks and orbits feathered. This latter group forms a very extensive division of the family, and is one which I had marked out for characterizing. If we limit the name of *Aratinga* to this latter group, and retain that of *Psittacara* to the true *Perruche-Aras*, we shall avoid all confusion in designating these divisions.

Although some confusion may at times arise in the variety of names which thus may be conferred on the same forms; yet it is in general a gratification to naturalists to find the justness of their views, respecting the separation of groups, confirmed by the corresponding sentiments of their fellow labourers in the same department of science. In the present instance I myself feel much pleasure in observing that those above-mentioned groups are considered by such an acute ornithologist as Dr. Spix, to be worthy of separation: and more particularly the former group of *Har-*

pagus, which belongs to a family where already it is alleged that there is too much subdivision, and where the introduction of a new name is pronounced to be an innovation scarcely to be tolerated. The fact before us proves that while we are debating about the principle of separating groups, others are actually separating them: while we are contending about the *quantum* of names which the fastidious taste or treacherous memory of a Zoological student may be enabled to embrace and to retain, others are imposing names without limitation. We thus lose the opportunity of taking that stand in science to which the resources, the intellect, and the industry of this country give us a right to aspire. And what will be the consequence? In the end we shall be obliged, as heretofore has been the case with respect to Zoology, to follow in the wake of our continental neighbours; we shall be forced, in fact, into a tardy adoption of their names and characters, for the very groups which our own indolence, or timidity, or blind adherence to a restrictive formula of nomenclature, has prevented us from naming and characterizing ourselves.

Some of the Brazilian species also, described in this Journal, have been equally described about the same time on the continent. The *Leistes Suchii* of this work [Vol. II. p. 92. tab. sup. 10] is the *Xanthornus Gasquet* of M. M. Quoy and Gaimard [Voy. aut. du Monde]; the *Psittacara frontata* [Vol. II. p. 389] is the *Arara macrogathos* of Dr. Spix; and *Psittacara Lichtensteini* is the *Aratinga cyanogularis* of the same naturalist. The latter bird has also been lately figured by M. Temminck, [Pl. col. 338,] under the name of *Psittacus cruentatus*. If we turn to the description of *Psittacara frontata* in this Journal, we shall perceive the observation that the species stands at the extreme limit of the genus where I have placed it, and might perhaps with equal justice be referred to the adjoining division of *Maccaws*. Accordingly we find that M. Spix has included it among the birds of that group. No single fact can prove more strongly the justice of those views which we are endeavouring so frequently to inculcate; namely, the arbitrariness of the divisions which we are

forced to institute for the sake of convenience in our science, and the total want of such divisions in nature.

Vol. I. p. 412.—“*Ierax*.”—This word, although it has been generally used as above written, should more properly be written “*Hierax*.” I therefore wish to substitute the more classical, for the more customary, orthography.

Vol. I. p. 412. — “*Psittacula Kuhlii*.”—M. Lesson, in the “Bulletin des Sciences Naturelles” for Nov. 1825. [p. 409], asserts that the above bird is “*simplement le Psittacus coccineus*, Shaw, le *Phigy* de Vieillot.” *—This may be the case.—But hitherto I have seen no proof of such a fact. The circumstances of there being a bird for thirty years in the Paris Museum that accords exactly with the description of *Ps. Kuhlii*, and of M. Lesson’s having a bird of the same beautiful species for several months alive in his possession,—circumstances which that gentleman advances in support of his assertion,—may be sufficient proofs that the species has been for some time familiar to Europeans, but none that it is identical with the *Phigy* of M. Le Vaillant. The representation of this latter bird, given in the 64th plate of the “Hist. des Perroquets,” is decidedly different to all appearance from the bird described in this Journal. A single character is sufficient to be particularized. The head of the *Phigy* is not crested; that of *Ps. Kuhlii* has an elongated and conspicuous crest. No crest at least is represented in M. Le Vaillant’s figure, or mentioned in his description of the *Phigy*; neither is it noticed as a character of the *Ps. coccineus* of Dr. Shaw, who directly refers to the plate of M. Le Vaillant. M. Lesson adds that the *Ps. fringillaceus*, Gmel., appears to be a variety of the same species. This also may be the case. There is however a fine specimen of this species in the British Museum, with which I have compared the *Ps. Kuhlii*; and although there is a general similarity in the disposition of the colours of these two birds, I am enabled to affirm that no two birds belonging to the same group can be more apparently distinct as species. The difference between them has been pointed out in the description of *Ps. Kuhlii*. On the whole I feel always inclined to keep *apparent*

* I take it for granted that M. Lesson means the *Phigy* of M. Le Vaillant.

species distinct, until they are proved to be identical. The confusion that has arisen in the very family of *Psittacidae* before us, should make us cautious of multiplying the alleged varieties of species. How many distinct species for instance are now discovered among the described varieties of *Ps. Alexandri*, Linn., *hamatodus*, Linn., and *Tabuensis*, Lath.! I suspect that *Ps. Amazonicus*, Linn., and its endless alleged varieties will, when properly examined, be found equally fertile in species.

Vol. II. p. 42. l. 9. Note.—For “*av*” read “*av*”.

—— p. 44. l. 17. Note.—For “*ψιτταξ*” read “*ψιτταξ*”.

—— p. 45. l. 3. Note.—For “Bochart coincides in this opinion,” read, “Bochart coincides in the opinion that *Parrots* were not natives of Syria.”

—— p. 376. l. 12.—“Pl. Col. 13. & 222.” *dele* “& 222.” The bird in this latter plate appears to be a *Neophron*. I was led into the error of placing the two birds to which I above referred, together as *Vultures*, in consequence of the identity of the specific names, awkwardly assigned to two birds in so small a family. They thus became confounded in my notes. A glance at the figures decides their difference.

—— p. 389. l. 21.—For “*Frontatus*,” read “*Frontata*.”

—— p. 402. l. 10. — “*Diplelectron*, *Vieill.* [*Polyplectron. Temm.*]” — The name of this genus of M. Temminck, and those of all the others of his Gallinaceous groups, are antecedent to the names of M. Vieillot for the same groups, and should be adopted in preference.

ART. LXI. *Analytical Notices of Books.*

Histoire Naturelle des Mammifères, avec des Figures originales, coloriées, dessinées d'après des Animaux vivans; Publiée sous l'autorité de l'Administration du Muséum d'Histoire Naturelle. Par MM. GEOFFROY - SAINT - HILAIRE, and F. CUVIER. Livraison 51^{me}.

IN the present number of this splendid and valuable publication, the most striking article is the description and figure of the type

of a new genus of *Mammalia*, to which M. F. Cuvier has assigned the name of *ARCTONYX*. In habit this animal, (the Bali-Souar, or Sand-Hog, of the Hindoos,) may be compared to a Bear furnished with the snout, eyes, and tail of a Hog. Of its dentary system nothing is known, except that it possesses six small incisors of equal length, that its canine teeth are long, and that these are immediately succeeded by flat molar teeth, which appear to be larger as they are more advanced in the mouth. Its movement is plantigrade, and its five toes, united by a narrow membrane throughout their whole extent, are armed with powerful claws an inch in length.

The hairs of the single species known to M. F. Cuvier, the *A. collaris*, are rough, thickly set, and long upon the body, while those of the head are short and depressed. The snout, which is flesh-coloured, has only a few bristles on its sides; and the belly is almost naked. The ears are short, covered with short hairs, and bordered with white. The hair, which is yellowish white with its apex black, gives to the fur a slightly blackish cast which varies in an undulated manner when the animal moves. The throat is yellow, and the sides of the head are marked with two black bands, which unite towards the snout. The lower band, which is very narrow, borders the upper lip; the other, which is much broader, covers the eye, embraces the ear, descends on the sides of the neck, and unites itself at the bottom of the shoulder with the black that covers entirely the anterior members: hence the part in front bounded by these black bands, although nearly resembling in colour the remainder of the body, seems to form a distinct portion of the fur. The hinder members are black like the anterior ones, and the hair which covers them is very rough. The yellowish white predominates towards the posterior part of the back, and the tail is furnished with large rough scattered bristles.

It is necessary to observe that this description is founded entirely on the notes of the late M. Duvaucel, who sent from India the drawing employed by M. F. Cuvier. No specimen of the animal has yet reached France: we may however observe that it is contained in the museum of the East India Company, and that auo-

ther specimen, which appears to be a distinct species, is exhibited in the collection of the Linnean Society. The form of this latter is much more elongated, and its fur, which is unfortunately considerably damaged about the head, is less bright in its colouring. We believe that this is about to be described by Dr. Horsfield.

From the number and form of the toes, and the disposition of the teeth, the genus *Arctonyx* evidently belong to the *Carnivora*, to the extreme of which and in close connexion with the Bears, it is referred by its plantigrade motion, its strong and curved claws, and its little inclination for flesh. Like the Bears moreover, when much irritated, it supports itself on its hinder feet, and exhibits in its arms and claws weapons equally to be dreaded with its teeth. In its flat and tubercular molar teeth, its preference for vegetables and fruits, and its snout apparently destined for digging, it deviates considerably from the Bears, and may therefore be perhaps regarded as the extreme of the *Carnivora*, forming the connecting link in the series of affinities between these and the omnivorous *Pachydermata*; which, M. F. Cuvier remarks, are separated from the Elephants and Horses, by such numerous and important characters as almost to tempt us to consider them as forming a distinct order, more closely allied to the *Carnivora* than they are generally assumed to be by systematic writers.

The remaining novelties of the present number relate entirely to species, and consist of an Ape, a Genet, and an Agouti. The first of these is described and figured under the name of *Simia Chrysopes*, a trivial appellation, which ought rather to have been *Chrysopus*, as it is derived from the golden colour of the feet, which principally distinguishes it from the other Sapajous. It is a native of North America.

The new species of Genet, *Genetta afra*, is a native of Barbary, and is noticed in Shaw's Travels under its Moorish denomination of Shib-beardou. It is the third African species, differing from the European ones, which has been determined by M. F. Cuvier, who points out the distinctive characters between these new animals. In size the Genet of Barbary is equal to that of the Cape, and exceeds the species which is found in Senegal. The colour, and even the markings of the whole are strikingly similar. They

are all of a more or less deep gray, mingled with yellowish ; and all have the extremity of the muzzle, the circumference of the eyes, and the upper part of the face, white ; the lower jaw, the sides of the muzzle, and the dorsal line black ; the body spotted with black, excepting its inferior parts, the head, the front of the ears, and the legs : and the tail is ringed. But the longitudinal bands of the upper part of the neck are more regular and uniform in the Genet of Senegal than in the others, and are much less interrupted in that of the Barbary than in the Cape species, in which they are in fact composed of a series of elongated spots. From the back to the bottom of the flanks there are in the Genet of Senegal only four rows of spots, in that of Barbary there are five, and in that of the Cape at least six. In the first the number of rings on the tail is at least ten, and this is terminated by white hairs ; in the second there are only eight rings, and the terminal hairs are black ; in the third the terminal hairs are also black, but the number of rings is ten. In the colouring of the hinder legs they are also distinguished. On the outer part of these members the Genet of Senegal exhibits a black spot which terminates in a distinct manner above the tarsus. In the Genet of Barbary this spot is much less distinct, and descends on the tarsus, embracing both sides of the leg ; while in the Cape species the leg appears to be entirely black.

The Agouti, *Cavia Aguti* L., is stated by M. F. Cuvier to comprehend two species which have hitherto been confounded together. To one of these figured in an earlier number of his work, he gives the trivial name of *aurata*, distinguishing the one described in his present *livraison* by the denomination of *cristata*. They are readily to be distinguished at the first glance by the rich and brilliant colours of the former, which present a striking contrast to the generally dull appearance of the latter. On further examination they are found to exhibit other differences. In the crested Agouti the upper part of the face is much more strongly arched than in the other species ; its ears are entirely flesh-coloured, and its feet tanned ; the hinder parts of its body are deep brown with a few yellow points ; and its cheeks, neck and shoulders, are black, the portion of the body between the

shoulders and the buttocks being brownish green. In the Golden Agouti on the contrary, the ear is bordered above by a broad black fascia, the hinder part of the body is of an extremely brilliant golden yellow, and the cheeks, neck and shoulders are of the same green colour as the middle of the body.

But considerable as these differences may appear, they are, as M. Cuvier observes, much less so when we examine their cause. In both these species the hairs are furnished with alternate rings of black and yellow. In those parts of the body in which the yellow and black share the visible portion of each hair, the fur exhibits the beautiful green tint which is seen on all the anterior parts of the golden Agouti. If the black slightly exceeds the yellow we have the colour of the middle of the body of the crested Agouti; if the yellow predominates considerably, it produces the golden hue of the hinder parts of the former animal; if the black, it gives the dull colour of the shoulders or thighs of the second, &c. In other words the most external characters of these animals present a community of features, a fact which may also be observed in numerous other genera. Thus to the experienced naturalist the mere appearance of the hairs is often a certain indication of relations of the most important kind, which might be expected to manifest themselves only in organs of a much more elevated order. This latter observation is well worthy of general attention, since, although it must have repeatedly occurred to every Zoologist, it is seldom so much adverted to as it deserves. In every department of animated nature this fact is equally to be traced; in the hairs of Quadrupeds, in the feathers of Birds, in the colours of Insects, and even in the texture of the shells of Mollusca.

Monographies de Mammalogie; ou Descriptions de quelques Genres de Mammifères dont les Espèces ont été observées dans les différens Musées de l'Europe. Par C. J. TEMMINCK, Livraison, 4eme.

AMONG the genera of *Mammalia* there is none more distinctly circumscribed in its limits, or more uniform in its characters, than

that which forms the subject of the present *livraison* of M. Temminck's Monographs, the genus *Felis*. In the osteology of the numerous species comprised in it, there is little except size to distinguish one from another; and size and colouring are almost the only characters which are applicable to the discrimination of living specimens. Founded entirely on these accidents, the groups to which are occasionally applied the names of Lions, Tigers, Lynxes, and Cats, are not entitled in a scientific point of view to the rank of even subgenera. These denominations are merely a familiar mode of expressing certain resemblances in colour and in size exhibited by some of the species, which, however, blend together so completely, as not to admit of any decided line of demarcation between them. The young of the Lion presents the spotted and streaked fur of the Tigers; these again are merely enlarged representations of Cats; nor is there in the pencils of hairs developed on the ears of the Lynxes any determinate character, varying as they do according to the age and the state of the fur. The genus *Felis* is therefore regarded by M. Temminck as a single and indivisible group, of which he describes twenty-seven species, and notices eight others as either doubtful or not yet sufficiently known. Common to both the old and the new continent, and presenting no distinctive mark, by which those species which are found in the one can be known from those of the other, he has nevertheless arranged them in two sections corresponding with their geographical distribution: but it is difficult to perceive what benefit is to be derived from this separation, founded on the mere fact of the countries which they inhabit, and supported by no organic difference whatever between the groups.

Of the first section, comprising those animals of the genus *Felis* which are found in the Old Continent and its Archipelagos, eighteen species are described; the second, or those of the new world, contains nine species. These we shall proceed to enumerate, interspersing the catalogue with the characters of the new species, and with occasional remarks, illustrative of the views entertained by M. Temminck on the subject.

*

1. *F. Leo*, including three varieties ; the Lions of Barbary, of Senegal, and of Persia.

2. *F. Tigris*.

3. *F. jubata*, the Hunting Leopard of Pennant, and Guepard of F. Cuvier ; an extremely interesting species on account of its domestication in Hindoostan, where it is employed in the chase. To the Zoologist it is highly valuable, as deviating from the type of the genus *Felis*, by the non-retractility of its claws, and thus becoming in some measure osculant between the *Feles* and the Dogs.

4. *F. Leopardus*, the Leopard. When adult smaller than the Lioness : tail as long as the body only, its extremity when reflected reaching to the shoulders : colour of the fur light yellowish fulvous ; that of the internal parts, and of the rose-like spots, deeper, or of a more lively yellow than the ground of the fur ; the numerous spots moderately distant from each other, the rose-like ones from 16 to 18 lines at the utmost in diameter : caudal vertebræ 22.

5. *F. Pardus*, the Panther. When adult less than the Leopard : tail as long as the body and the head, its extremity when reflected reaching to the tip of the nose : colour of the fur deep yellowish fulvous, its internal part being marked with rose-like spots of the same colour as the ground of the fur ; the numerous spots closely approached to each other ; the rose-like ones from 12 to 14 lines at the utmost in diameter : caudal vertebræ 28.

Of these species, the synonymy of which has been beyond measure confused by the almost indiscriminate employment of the names of Leopard, Panther, Jaguar, and Ounce, the above characters are given by M. Temminck. It appears that even our Parisian neighbours have not sufficiently attended to the distinctive characters laid down by Linné, there being still exhibited in the galleries of the Museum under the name of Panther, a specimen of the Leopard. Of the true Panther there is no trace of a specimen having ever existed in that extensive collection. Hence the Panther of Cuvier, and the male Panther of Buffon and Schreber, are to be viewed as Leopards, together with the Ounce of

Of the true Panther there exists no correct figure. The Leopard appears to be confined to the East, no African specimen having been detected by M. Temminck, in his very extensive enquiries.

The black Tiger, *F. Melas*, the Rimau Kumbang of Sir Stamford Raffles, is regarded as merely a dark variety of the Leopard. Professor Reinwardt and M. Kuhl have stated, from the testimonies of the natives of Java, that there are frequently found in the dens of the Leopard young individuals, one of which is spotted like the parent, while the other is dark, corresponding with the *F. melas*.

The *F. Uncia* L. is also to be erased from the list of species, as it is merely the young of the Leopard or of the Panther; to either of which the published figures of it may be readily referred, by attending to the proportionate length of the tail.

6. *F. macrocelis*, a new species, which has been described by Dr. Horsfield in the Zoological Journal, i. 542; and of which the twenty-first plate of that volume presents a figure.

7. *F. Serval*, comprehending the *F. Serval* and *F. Capensis* of Linné, together with the Chat-pard of Desmarest, and the Caracal of Algiers of Bruce.

8. *F. cervaria*. Size nearly that of the Wolf: tail when reflected extending beyond the head; smaller at the apex than at the base, and terminated by a large black space: labial whiskers pure white throughout from the base to the point: pencils of the ears either very short or altogether wanting; cheek whiskers moderately long: nose rather elongated.

Such are the characters assigned to a species which may possibly be the Kattlo of Linné and the Swedes, but of which no skins are contained in the cargoes that arrive from the Baltic. In commerce the skins of the *F. cervaria* are only obtained from the markets of Moscow, which receive them from the provinces of Asia. It appears probable that this species may have been confounded under the name of the Canadian Lynx, with the following.

9. *F. borealis*. Size less than that of the preceding, intermediate between the Fox and the Wolf: tail when reflected not extending to the extremity of the head, obtuse and apparently

truncated at its apex; the extreme point alone black: labial whiskers black at their base and white above: pencils of the ears long: cheek whiskers very long: nose very obtuse.

This species, which comprehends the Canadian, but not the Mississippi, Lynx of M. Cuvier, has not hitherto been sufficiently distinguished from the preceding. It inhabits the Northern parts of both the old and the new Continents, and its fur, which is less valuable in commerce than that of the *F. cervaria*, is obtained equally from Sweden and from Hudson's Bay.

10. *F. Lynx*. Body thick, rather elevated upon the legs: head thick, rounded; ears acuminate, terminated by a pencil of long hairs: tail when reflected reaching as far as the extremity of the head, its smaller half towards the apex entirely black: four or five small undulated black bands on the cheek: labial whiskers white, arranged on four or five black streaks: no small anterior, or false molar tooth.

We have given the character of this well-known species for the purpose of discriminating between it, the two preceding, and the following, species; which, with the *F. rufa* of North America, are closely allied to each other.

11. *F. pardina*. Size of the Badger, but higher upon its legs; resembling in form and size the *F. rufa*: tail short, but in proportion to its size longer than in the *F. Lynx*: pencils of the ears very distinct: cheek whiskers large: nose and tail covered with black reticulations.

This species, the Loup Cervier of Perrault, under which name several other species are comprehended by the Continental furriers, is found only in the South of Europe, the true Lynx inhabiting the centre.

12. *F. Caracal*; the Nubian Caracal and Cat of the Desert of Bruce, and the Persian Cat of Pennant.

13. *F. aurata*. Rather less than the Caracal; tail only half the length of the body, with a brown band along its middle, and its extreme point black: ears short, rounded, without pencils: fur very short and shining.

The country of this species is unknown, the skin from which

the description is made having been purchased from a dealer in London.

14. *F. Chaus* of Guldensted, figured by Schreber. The other animals described under this name are referable to the next species.

15. *F. caligata*: the Booted Lynx of Bruce, *F. Lybicus* of Olivier, and Lybian Caracal of Buffon.

16. *F. Catus*.

It has been generally conceived that this species is to be regarded as the original stock of the domestic Cat, but M. Temminck doubts the correctness of this opinion, which appears to him to be contradicted by the general fact that domesticated animals become larger than the wild stock from which the race has sprung. Our common Cat, which, like the Dog, is spread over the world wherever man inhabits, is on the contrary smaller than the wild one of the Northern parts of Europe. In their tails they also differ considerably; that of the wild Cat being thick and short, equally large throughout and not reaching when reflected farther than the scapula; while in the domestic Cat it is longer and more slender, and diminishes in thickness towards its extremity. M. Temminck therefore regards the latter as being probably descended from the succeeding species, which inhabits Egypt; a fact, which, assuming that country as the centre of civilization, he holds to be strong confirmatory evidence of the correctness of his opinion.

17. *F. maniculata*, a new species sent from Nubia by M. Ruppel. Size one-third less than that of the *F. Catus*; proportions nearly the same as in that species, with the exception of the tail, which is longer and more slender: ears without pencils: sole of the feet, and hinder part of the metacarpus and of the metatarsus perfectly black.

18. *F. minuta*, a name, which, as applied to a species already well known under another denomination, cannot be adopted. It is the *F. Javanensis* of Dr. Horsfield's Zoological Researches in Java, and this trivial appellation is altered by M. Temminck, on account of the impropriety, as he alleges, of employing names derived from the countries in which animals are first discovered.

The conflicting opinions of Zoologists on this point we need not mention : that quoted from M. F. Cuvier in a note on p. 230 of the present volume, being diametrically opposed to M. Temminck's. But the propriety or impropriety of employing such names does not fall fairly into discussion in this instance ; such an enquiry, how indispensable soever previous to designating a species, becomes too late when the name has been applied. It must then be of necessity retained, unless it conveys a decidedly false impression ; and even in this case, considerable hesitation would be experienced by every naturalist, who felt unwilling to increase the confusion already too prevalent in synonymy.

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19. *F. concolor*, including the animals described by Linné under this name and that of *F. discolor*, being those commonly known by the appellations of Cougar and Puma.

20. *F. Onca*, the Jaguar. Buffon's Jaguar is the *F. pardalis*, and his figure entitled the Female Panther is a representation of the *F. Onca*.

21. *F. Jaguarondi*.

22. *F. celidogaster*. Size of the Fox : face broad and obtuse ; tail rather shorter than the half of the body and the head ; ears moderate : labial whiskers black, with their extremities white : all the under parts marked with large round spots.

This new species, which was said to have been brought from the Coast of Chili or that of Peru, was exhibited at Exeter Change. It afterwards formed part of Mr. Bullock's collection, at the sale of which it was purchased by M. Temminck.

23. *F. rufa* of Guldensted, the Bay-Cat of Pennant. With this species M. Temminck describes also a specimen brought from Mexico by Mr. Bullock, which may probably prove to be distinct, as it exhibits no spot or streak on any part of its fur, except the single broad blackish band along the middle line of the back ; the extreme point of the tail is black, while in the *F. rufa*, although its end is black, there are a few white hairs at the very apex.

24. *F. pardalis*, the Ocelot. Size nearly that of the Lynx, but less elevated on its legs : tail half the length of the body and

the head : with long bands on the flanks proceeding from between the shoulders, and terminating without interruption on the thighs.

25. *F. macroura*. Size less than that of the *F. pardalis*, lower on its legs, and its body more elongated : tail as long as the body and the neck, its extremity when reflected reaching to the occiput : with long bands on the flanks which are more or less interrupted.

These two species were confounded together by Linné under the name of *F. pardalis*; the latter, although specimens of it have been long known, having been first determined by the Prince de Neuwied. The Mexican Tiger of Pennant appears to be a representation of the *F. macroura*.

26. *F. mitis*, the Chat of M. F. Cuvier. Size less, more slender and graceful than in the preceding species : tail nearly half the length of the body and the head : spots not numerous, rose-like, small and irregular, more or less rounded, and deeper in colour than the ground of the fur, which is generally *blond* or very light fulvous.

27. *F. tigrina*.

The Tigers which M. Temminck has not seen, and which he has consequently been unable to describe, or to refer to their proper position, are eight in number; the Rimau Mangin, and the Rimau Chigan of Sir Stamford Raffles; the Felis Manul of Pallas; the Chat Pampa, and the Eyra of D'Azzara; and three species sent from North America by M. Rafinesque. Two other species described by Molina, appear scarcely to merit insertion, even in a catalogue of doubtful species, that author having, according to M. Cuvier, written from memory in Italy his natural history of Chili.

In the preceding analysis of the results of M. Temminck's labours in this very interesting genus, we have gone into greater detail than usual, with a view of laying before such of our readers as may not see the work itself, an outline of its contents sufficient to convey a correct idea of them. That the subject is not yet exhausted, and that somewhat may still be added to it even from our present collections, we have no doubt. But whatever falls from the pen of so sedulous an enquirer, is well worthy of atten-

tion, founded as his facts universally are on the most patient and laboured investigation. That such has been the case on the present occasion, is proved, by the references to the various collections of Europe, nearly the whole of which have been visited in the progress of his work. Nor are the descriptions founded only on living or on set-up specimens; to trace them with more accuracy and to obtain a more ample view of their frequent variations, he has also had recourse to the warehouses of furriers in all the principal commercial towns, without a continual examination of which, he repeats again and again, no certainty can exist with respect to the species of *Felis*. All those which he has admitted appear in fact to be founded on numerous specimens, with two exceptions only; and it is well worthy of remark, *that the unique skins of both these species were purchased in London, to adorn the museum of the Netherlands*. On this we need offer no comment. The British Zoologist cannot fail to apply the fact.

Memoires de la Société d'Histoire Naturelle de Paris. Tome ii. (Première Partie). 4to. pp. 248. Plates xiii.

Of the papers contained in the present portion of a volume of the Transactions of the newly established Society of Natural History of Paris, one alone relates to recent Zoology. In this, a "Notice on the animal of the genus *Argonauta*," the Baron de Ferussac enters into the discussion of a question, the peculiar interest of which is universally acknowledged. Almost from the earliest period to which the records of natural history ascend, the relation borne to the elegant shell of the *Argonauta Argo* by the Cephalopode, which is occasionally found to inhabit it, has been a subject of dispute. While some have regarded the shell as being actually constructed by this animal, others have believed that the animal is merely a parasite, seizing like a *Pagurus* upon an empty shell, and having like that Crab, no share whatever in its formation. The latter of these opinions is stated by Pliny to have been advanced by Mutian; it has been successively adopted by a long

list of distinguished naturalists ; and it is still maintained by Dr. Leach, on the evidence of the unfortunate Cranch, by Sir Everard Home, and especially by M. de Blainville. On the other side, names of equally high authority might be advanced. In our own times MM. Bosc, Lamarck, and Cuvier, who in the earlier part of their zoological career had advocated the doctrine of the parasitic nature of the animal in question, have been converted to the opposite opinion, and have avowed their belief that the shell and the animal are mutually connected *ab ovo*, the former being entirely constructed by the latter. This is also the opinion of M. de Ferussac, who supports it by several facts observed in a small specimen recently sent to him in spirits, by M. Risso of Nice.

In this specimen the shell was completely filled by the Cephalopode, which was octopodous, and corresponded with the description usually given of the animal found in the *Argonauta Argo*. When thus retracted within the shell four of its arms were found to be bent down upon its back within the enlarged keel, in such a manner, as to apply the suckers with which they are furnished, against the internal surface of the keel. The remaining four arms were folded, in the opposite direction, into the spiral cavity of the shell, which they filled ; the intermediate pair, or the palmate arms destined to support the eggs, occupying the middle, and forming a mass, over which were folded the extremities of the outer pair, these latter resting, through the greater part of their extent, upon the sides of the body. On breaking the shell, the mantle was found to correspond precisely with its internal surface, presenting a repetition of the sulci, of the broad and flat keel, and of the tubercles which are disposed along its sides.

This exact accordance of the form of the animal with that of the shell, and its complete adaptation, when retracted, to the different parts of its habitation, are the only facts adduced from observation by the Baron de Ferussac in support of his opinion. His explanation of the probable arrangement and uses of the arms in floating, it is unnecessary to advert to, it being entirely founded on theory. The remainder of his paper consists of arguments drawn from the facts, that no other animal has been at any time found in the

shell in question, and that the same animal has never been found apart from the shell, excepting perhaps by M. Rafinesque.

On this latter point, and on the fact observed by Cranch, of the animals having quitted at pleasure the shells in which they were found, he justly remarks that no positive conclusion of their parasitic nature can be founded; it being almost certain that this singular faculty must be possessed by the true inhabitant of the *Argonauta*, which, on the authority of M. de Blainville, cannot be attached to its shell, on the internal surface of which no muscular impression whatever is to be traced. It is to this peculiar circumstance, which is perfectly anomalous among the Mollusca, that the whole of the difficulties with respect to this shell and its inhabitant are to be ascribed. These difficulties are not, we think, satisfactorily cleared up by the present notice; for although its distinguished author has certainly succeeded in showing an intimate connexion between them, nothing less than a series of carefully conducted observations on numerous living specimens, continued through more than one generation, can finally dispose of the question.

Our opinion that such a series of observations is still necessary, is not in the least shaken by a note appended to M. de Ferussac's paper, in which it is stated on the authority of an Italian Journal, that the Chevalier Poli had discovered, by means of the microscope, the daily developement of the embryo, and the commencement of the formation of the shell, in the eggs of the Cephalopode, found in the *Argonauta Argo*. True it is, that if thorough reliance could be placed on this discovery, it would at once be decisive of the dispute; if the shell be really formed in the egg, the animal must be the original inhabitant and constructor of it. But the difficulties attendant on very minute microscopical observations are so great and obvious, that we may well be allowed to hesitate, before receiving them with implicit confidence. In this instance, we are bound to view them with peculiar distrust; for the observation of the Chevalier Poli is contradicted by that of M. Bauer, than whom no one is better versed in the management of the most powerful glasses, and who has stated in the *Philosophical Transactions* for 1817, that what has been taken for

shell is merely the vitellum of the egg. We therefore repeat, that individuals must be bred by some able naturalist, that their daily developement must be observed, that the eggs must be watched until the animals have attained their full growth, and that until this has been effected, doubts will still continue to exist.

The remaining articles connected with Zoology which are contained in this volume, are chiefly geological, the references to the animal kingdom, being, with one exception, almost entirely incidental. In the "Geological Description of the Tertiary Basin of the South-west of France, by M. B. de Basterot," the author gives the characters, descriptions, and synonyms, of three hundred and thirty species of fossil shells collected in the neighbourhood of Bourdeaux, many of which are figured in the accompanying plates. Although many of them are new, they present too little which is of general interest to induce us to enter into particulars with respect to them. We shall therefore limit our notice of this article to a single observation advanced in it, which is equally applicable to the Zoology of the present age, and of past ages.

It may be affirmed, says M. de Basterot, that no species of *Mollusca*, whether inhabiting the land or the water, is to be found perfectly identical in two or more situations, which are considerably distant from each other, or in which there exists a difference in the nature of the soil or of the waters. A little more or less of elongation in all the parts, of prominence in the striæ and in the tubercles, of thickness in the folds, &c. is always to be met with, and the determination of species is thus rendered a very difficult task. In the examination of a long series of species from different localities, there appears to be a kind of succession of undulations around certain determinate forms, extending so far that the extremes of one are confounded with those of another, the centres still remaining perfectly distinct. The great extent of these variations, is readily to be accounted for on the principle of Cuvier, that the differences which constitute varieties depend on determinate circumstances, and that their developement increases, in proportion to the inten-

sity of these circumstances. More completely than any other class of the animal creation the Mollusca are the slaves of circumstances, possessing not the power of withdrawing themselves from external influences ; and if the change of food and habitation has been sufficient to vary almost to infinity the forms of our domestic animals, and even of our cultivated plants, ought not also the difference of soil, of depth, of temperature, and of agitation in the waters in which they dwell, to produce an equal extent of varieties in the inhabitants of the sea? The local varieties, though well known to those whose faculties have been sharpened by interest, are yet unnoticed by the naturalist. To him the common Oyster is the same, no matter on what shore it may have been taken ; but to the dealer, even of moderate experience, the locality from which it arrives is at once evident on mere inspection.

Entomologische Monographien. — Entomological Monographs.

By Dr. FR. KLUG, Director of the Royal Zoological Museum, &c. &c. Berlin. 1824. 8vo. pp. 242. Coloured plates x.

To the student of Entomology the name of Professor Klug is well known, not merely on account of his official situation in charge of a collection of Insects which is probably the most extensive in the world, but also for the abilities he has displayed in his repeated attempts at rendering available to the purposes of science, the rich stores with the care of which he is entrusted. Engaged as his time must necessarily be, in the numerous duties connected with the preservation and arrangement of that immense and continually increasing cabinet, his leisure cannot be sufficient to enable him to prepare any very extensive work, and he has therefore limited himself hitherto to the descriptions of certain genera, or of some of the more striking insects, which he has given to the world, either in a detached form, or through the medium of the learned societies of Germany. His present work, contains one of these monographs, with very important additions, together with several others which have not before appeared ;

and embraces *Coleoptera* as well as *Hymenoptera*, including several new genera in the latter order, in which the learned author is peculiarly versed. The whole of the insects described are exotic, and with very few exceptions, extra-European; and it might almost be added that the whole of them are new, for the number of those which had been previously described, is quite insignificant in proportion to the mass. A rapid enumeration of the genera noticed, with the characters of such as are new, and the number of species described in each, will be sufficient to afford a general idea of the present publication.

Of *Ctenostoma*, a genus first determined by the learned author, three species are described, two of these having been formerly characterized by him. Of *Agra* the number of species is twenty; seven having been now added to the list which he had previously given in the Transactions of the Leopoldine Academy. The species of *Megalopus* described are thirty-one; the whole, with the exception of one African species, being natives of South America. To these are to be added the *M. dorsalis* of Olivier, and the *M. sexmaculatus* of Kirby, making the number now described thirty-three. In *Chlamys* the number of species is still more considerable. Those described by M. Klug are sixty-four, sixty of which are contained in the Berlin collection. From an additional note, we learn that this number is to be increased to eighty-four, there being twenty other species described in the "Monographia Chlamydim" of M. V. Kollar, published at Vienna, in the earlier part of 1824. The whole number contained in this latter work is only forty-five, which are divided into two sections; those with the suture of the elytra smooth, and those in which it is serrate; a division which appears to be scarcely necessary, as the first comprises only four species. One of the species of *Chlamys* described by Professor Klug, under the name of *C. braccata*, is added to that genus with considerable doubt. It is a very remarkable insect, and was regarded by Count Von Hoffmannsegg as the type of a new genus to which he gave the manuscript name of *Calosciartes*. It differs from the other species of *Chlamys* in the great length of its antennæ, which exceeds that of the body, and in the thickness of its hinder thighs. Of *Mastigus* there are

three species given, two of which are new ; and reference is made to the descriptions of three others, making in the whole six species.

PACHYLOSTICTA, the first Hymenopterous genus noticed, is new. It contains three species, (the males of which only are known,) which at first sight closely resemble the *Hylotomæ*. Its characters are, "Antennæ short, clavate, 5-jointed : anterior wings dilated at their apex, stigma semilunar ; marginal cells two ; submarginal three, the second of these penetrated by a recurrent nerve : second, third, and fourth joints of the hinder tarsi very short." All the specimens yet received are from Brazil, to which country also the following genus, which is closely allied to *Pachylosticta* is referable. It is worthy of remark, that as of *Pachylosticta* males only are known, so of *Syzygonia* none but females have hitherto been seen by Professor Klug. *SYZYGONIA* ; "Antennæ short, clavate ; with four or five joints before the club ; club solid : marginal cell solitary, appendiculate ; submarginal, four." The species, which are two in number, are related to the genus *Abia* of Dr. Leach. Of *Tarpa*, of which there were only two species previously known, there are now described nine ; of *Cryptocerus*, ten, with reference to three others, making in all thirteen : and of *Ceramius*, four species.

Philosophical Transactions of the Royal Society of London. For the year 1825. Parts i. and ii. 4to. pp. 585. plates xxix.

IN those portions of our previous numbers which are devoted to the Proceedings of Learned Societies on subjects connected with Zoology, such ample notices have been given relative to the papers contained in the present volume of the Philosophical Transactions, that, with one exception only, nothing remains to be done in our analytical department, save the enumeration of the articles, accompanied by a reference to those of our pages in which their more prominent facts have been already embodied.

Of the four Papers from the pen of Sir Everard Home, the first,

“The Croonian Lecture, On the existence of Nerves in the Placenta;” has been analysed at page 581 of our first volume: the second, entitled “Observations on the changes the Ovum of the Frog undergoes during the formation of the Tadpole,” at page 582 of the same volume: the third, “Observations on the Influence of the Nerves and Ganglions in producing Animal Heat,” was regarded as too purely physiological to require extensive notice: the leading facts of the fourth, “Microscopical Observations on the materials of the Brain, and of the Ova of Animals, to show the Analogy that exists between them,” being given at page 277 of our present volume. The very interesting paper by Dr. J. R. Johnson, entitled “Further Observations on the genus *Planaria*,” has been in like manner analysed at page 132 of our present volume; as has also “An Essay on Egyptian Mummies; with Observations on the art of embalming among the ancient Egyptians, by Dr. Granville,” at page 272. The leading facts of a “Notice of the *Iguanodon*, a Fossil Herbivorous Reptile, found in the sandstone of Tilgate Forest; by Gideon Mantell, Esq.,” will be found at page 130; and those of the paper “On the fossil Elk of Ireland; by T. Weaver, Esq.” at page 275 of our present volume.

The exception alluded to at the commencement of our notice is in favour of the paper “On the Anatomy of the Mole-Cricket; by Dr. Kidd;” the contents of which, referring as they do to the detailed and minute examination of an insect, obviously could not be sufficiently understood unless on the most attentive perusal. Even now, with the paper itself, and with the figures by which it is illustrated, before us, we find it impossible to convey an adequate idea of it without following the author at greater length than our limits will permit. We must, therefore, refer to the article itself such of our readers as may be desirous of particular information, relative to the anatomy of the *Gryllotalpa vulgaris*, which forms an interesting supplement to the labours of M. Marcel de Serres, and of Sir E. Home, and to the very extensive and admirable series of anatomical details of the *Coleoptera*, for which we are indebted to M. Audouin, and which are still continued, with unabated zeal and ability, in the *Annales des Sciences Naturelles*.

One suggestion advanced by Dr. Kidd, appears to be deserving of further investigation. If the sanguineous circulation of insects be carried on by the transudation of the chyle through the coats of the intestines, by its subsequent general diffusion through the interior of the body, (a diffusion, of which however he denies the existence,) and then by its absorption into the substance of particular organs, as the hepatic tubes, the vesiculæ seminales, the ovaries, &c. ; how, he enquires, does it happen, that the bile, for instance, does not transude through the coats of the same vessels, the pores of which have admitted the blood from which it has been formed ? It may, he observes, be answered; that the alteration which the blood undergoes in the several organs, changes its properties to such an extent, as to render it incapable of repassing through the pores which admitted it. Such may indeed be the fact; but the circulation of insects, if the term may be allowed, though beset with difficulties, presents an interesting field of enquiry, to the acute physiologist, whose ambition may prompt him to attempt the elucidation of a subject, in which even Cuvier has been foiled. Dr. Kidd conceives that the tracheæ, which in their minute ramifications pervade every part of the body, may possibly be the instruments of the circulation in insects; that they may absorb the blood or chyle in the first instance from the internal surface of the alimentary canal; that, by the exhaustion of the air from individual tracheæ, the absorbed fluid may be drawn on, towards the two lateral tracheal tubes, which are apparently a general medium of communication between all the other tracheæ of the body, and that, having once reached this point, it is forwarded to the most distant parts of the body, by a modification of the same means by which the air itself is forwarded. That blood has not been seen in the tracheæ, excepting apparently in two instances by Dr. Kidd, cannot be admitted in refutation of the hypothesis of their employment in the circulation, since, in the higher orders of animals, the arteries are found, after death, equally devoid of any traces of that fluid.

The Genera of Recent and Fossil Shells, for the use of Students in Conchology and Geology. By G. B. SOWERBY, F.L.S.
With original Plates, by J. D. C. SOWERBY, F.L.S.
No. xxvii.

IN this number, as in the preceding ones, five genera are illustrated. 1. *Siliquaria*; an interesting genus of *Annelida*, separated from the Linnæan *Serpulæ* by Bruguiere; the very splendid specimen of the *S. anguina*, which formed part of the Tankerville collection, being the prominent figure in the accompanying plate. 2. *Octomeris*; a new genus of *Cirripeda* described by Mr. Sowerby, at page 244 of our present volume. 3. *Pinna*; illustrated by the *P. serrata*, and the *P. nigrina*, forming two plates. 4. *Mytilus*; the species figured being the *M. achatinus*; *M. crenatus*; and the *M. polymorphus*, a native of the Danube, which has recently been naturalized in the Commercial Docks, near London. 5. *Modiola*, illustrated in two plates, which exhibit the *M. picta*, *M. Silicula*?, *M. Tulipa*, *M. semifusca*, *M. plicata*, *M. discrepans*, and *M. discors*. The two latter species, which are natives of the British coasts, differ much, as Mr. Sowerby observes, from the common *Modiolæ*, and might, perhaps, with propriety be considered, together with some others, that resemble them in form, as constituting a distinct genus.

ART. LXII. *Proceedings of Learned Societies on Subjects connected with Zoology.*

ROYAL SOCIETY.

AT the Anniversary Meeting of the Royal Society, held on St. Andrew's Day, Nov. 30. 1825, the under-named Fellows were elected Council and Officers for the ensuing year:

Of the Old Council.—Sir H. Davy, Bart.; Francis Baily, Esq.; W. T. Brande, Esq.; Samuel Goodenough, Lord Bishop of Carlisle; Davies Gilbert, Esq. M.P.; J. F. W. Herschel, Esq.;

Sir Everard Home, Bart. ; Captain H. Kater ; John Pond, Esq. ; W. H. Wollaston, M.D. ; Thomas Young, M.D.

Of the New Council.—John Barrow, Esq. ; John Bostock, M.D. ; Sir A. P. Cooper, Bart. ; Benjamin Gompertz, Esq. ; Stephen Groombridge, Esq. ; Sir Abraham Hume, Bart. ; Daniel Moore, Esq. ; Richard, Earl of Mount Edgecombe ; P. M. Roget, M.D. ; James South, Esq.

President.—Sir H. Davy, Bart.

Secretaries.—W. T. Brande, Esq., and J. F. W. Herschel, Esq.

Treasurer.—Davies Gilbert, Esq., M.P.

Dec. 8.—A paper was read, entitled, *Additional proofs of the source of Animal Heat being in the Nerves.* By Sir E. Home, Bart. V.P.R.S.

This paper contains the account of a repetition of the author's former experiments, upon the effects of dividing the nerves supplying the velvet of the deer's horn, in which the same results have been obtained ; while some exceptionable parts of the former proceedings have been carefully avoided. It was now found, as before, that immediately upon the division of the nerves of one horn, the temperature of that horn was diminished sometimes to the amount of 7°, and that in the course of ten or twelve days, the disparity of temperature between the two horns began to cease, and they ultimately again attained precisely the same temperature. When this had taken place, the deer was killed, and the parts were carefully dissected and examined ; when it was found, that the interval occasioned by the recession of the divided nerves, was filled up by a newly-formed substance, which firmly connected them ; and this explained the restoration in their functions, which had taken place.

In further proof of the influence of the nerves over the evolution of heat, independent of mere sanguineous circulation, Sir Everard adverts to a case of aneurism, in which he tied the femoral artery immediately below Poupart's ligament. The obstruction of this large arterial trunk, however, did not occasion any diminution of temperature in the foot, below the natural standard.

Dec. 15.—The President announced to the Society His Majesty's munificent foundation of two annual prizes, consisting each

of a medal of the value of fifty guineas, to be bestowed as honorary distinctions by the President and Council, on the authors of such new discoveries as they may deem worthy of the award; and in such manner as shall best promote the objects for which the Royal Society was instituted; and the interests of science in general.

Dr. J. R. Johnson, F.L.S. elected into the Society in 1817, and whose name had then been inserted in its printed lists, was admitted a Fellow of the Society; and the *Croonian Lecture*, by Sir E. Home, was read. The subject of this lecture was the Structure of Muscular Fibre.

Dec. 22.—Gideon Mantell, Esq. F.L. & G.S. was admitted a Fellow of the Society; and the following papers were read:

On the Poison of the Common Toad; by J. Davy, M.D. F.R.S. The popular belief in the venomous nature of the Toad, Dr. Davy states, though of great antiquity, has been rejected as a vulgar prejudice by modern naturalists, decidedly so by Cuvier; but like many other long-received and prevalent opinions, it is a true one, and the denial of it by philosophers has resulted from superficial examination. Dr. D. found the venomous matter to be contained in follicles, chiefly in the cutis vera, and about the head and shoulders, but also distributed generally over the body, and even on the extremities. On the application of pressure, this fluid exudes, or even spirts out to a considerable distance, and may be collected in a sufficient quantity for examination. It is extremely acrid when applied to the tongue, resembling the extract of aconite in this respect, and it even acts upon the hands. It is soluble, with a small residuum, in water, and in alcohol, and the solutions are not affected by those of acetate of lead and corrosive sublimate. On solution in ammonia, it continues acrid; it dissolves in nitric acid, to which it imparts a purple colour. By combination with potash or soda, it is rendered less acrid, apparently by partial decomposition. As left by evaporation of its aqueous or alcoholic solutions, it is highly inflammable; and the residuary matter, which appears to give it consistence, seems to be albumen. Though more acrid than the poison of the most veno-

mous serpents, it produces no ill effect on being introduced into the circulation; a chicken inoculated with it was not affected.

The author conjectures that this "sweltered venom," as it is correctly termed by our great Dramatist, being distributed over the integuments, serves to defend the Toad from the attacks of carnivorous animals: "to eat a toad," has long been held as an opprobrious difficulty; and the animal is still further protected in this respect by the horny nature of its cutis, which contains much phosphate of lime, &c. As the venom consists in part of an inflammable substance, it is probably excrementitious, and its excretion auxiliary to the action of the lungs in decarbonizing the blood. This view of its use is confirmed by the fact that one of the two branches of the pulmonary artery supplies the skin, its ramifications being most numerous where the follicles of venom are thickest.

Dr. Davy has found the skin of the Toad to contain *pores* of two kinds; the larger, chiefly confined to particular situations, and which, when the skin is held up to the light, appear as iridescent circles, and the smaller, more numerous and generally distributed, which appear as luminous points of a yellowish colour. Externally these pores are covered with cuticle, and some of the larger ones even with rete mucosum; internally they are lined with delicate cellular tissue. By inflating the skin, Dr. D. ascertained that it was not furnished with spiracula, the existence of which he had been led to suspect by some particular circumstances in the physiology of the animal.

On the Heart of Animals belonging to the Genus Rana; by the same author. Dr. Davy has discovered that the heart of the Common Toad, the Bull Frog, and the Common Frog, instead of consisting of one auricle and one ventricle, as generally stated, has two auricles, divided by a septum of fibrous substance; and he has reason to believe that this structure prevails throughout the order of *Batraciens*. This discovery removes the anomaly among Reptiles supposed to be presented by these animals, as forming a portion of the link between Mammifera and Fishes, and preserves unbroken the chain of connection between Reptiles

and Fishes, arising from the analogy of their respective organs of respiration.

Feb. 16.—A paper was read, On the Circle of Nerves which connects the voluntary muscles with the Brain; by Charles Bell, Esq. F.R.S. E. Communicated by the President.

LINNEAN SOCIETY.

December 6.—A continuation was read, of A Systematic Catalogue of the Australian Birds in the Collection of the Linnean Society; by N. A. Vigors, jun. Esq. F.L.S. and Thomas Horsfield, M.D. F.L.S. and G.S.* This portion of the Catalogue included the subfamilies *Ptyctolophina* and *Palæornina*, of the *Psittacidae*.

December 20.—The reading of the Catalogue of Australian Birds was continued; and a paper was also read, containing Descriptions of some new species of Birds belonging to the genera *Phytotoma*, *Indicator*, and *Cursorius*; by Mr. Benjamin Leadbeater, F.L.S.

January 17.—A paper was read, On some Cornish Species of the Genus *Labrus*; by Mr. Jonathan Couch, F.L.S. Among other species noticed in this communication were *Labrus Julis*; *Tinca* (Common Wrasse); *cornubiensis* (Goldsinny); *microstoma* (Corkwring); *trimaculatus*; and *Comber*: also *Perca inermis*.

February 7.—A paper was read, entitled, "A description of the *Plectrophanes Lapponica*, a species lately discovered in the British Islands: by Prideaux John Selby, Esq. F.L.S. M.W.S., &c."

The bird described by Mr. Selby is the Lapland Bunting, *Fringilla Lapponica*, Linn., *Emberiza calcarata*, Temm., Fam. *Fringillidae*, Vigors; Genus *Plectrophanes*, Meyer.

This genus is intermediate between *Alauda* and *Emberiza*. It approaches the former in the thickness of the bill, the form of the feet, and the production of the hinder claw. Its affinity to *Emberiza* is shewn by the peculiar form of the bill, characteristic of that genus: it differs from it, however, in having the first and

* See the present volume, p. 137, 279, 281.

second quill-feathers nearly equal in length, and the longest in the wing.

March 21.—A paper was read, entitled, "Descriptions of two new Birds belonging to the family of *Phasianidæ*, by Major-General Hardwicke, F.L.S.

The first of these birds is a species of M. Temminck's genus *Lophophorus*; and General Hardwicke proposes to call it *L. Wallichi*, after Dr. Wallich, the distinguished Curator of the India Company's Botanic Garden at Calcutta; through whose exertions, aided by the influence of the Hon. Edward Gardner, the English resident at the court of Katmandu, many interesting subjects in Ornithology have been procured. In beauty, it is not inferior to the Impeyan Pheasant, another species of *Lophophorus*, which it resembles in size. It is a native of the Almorah hills on the north-eastern boundary of Bengal, where it is called *Cheer*.

The second species is a true *Phasianus*, and will form, together with *P. cruentus*, a small but well-marked group of that interesting genus. General Hardwicke denominates it *P. Gardneri*. It is a native of the Snowy Mountains, north of the valley of Nepâl.

April 4.—Dr. Penneck presented the skins of *Delphinus Delphis* and a species of *Sparus*, taken on the coast of Cornwall.

A paper was read, *On the quinary and dichotomous arrangements in Natural History*; by H. T. Colebrooke, Esq. F.R.S., F.L.S., &c.

ZOOLOGICAL CLUB.

July 12, 1825.—The Secretary exhibited a specimen of the *Ardea comata*, Pall., or the *Squacco Heron* of British Ornithologists, which was communicated to him by Mr. Leadbeater for the information of the Club. This rare visitor of the British Islands was lately shot near Bridgewater. Its weight was eight ounces.

Mr. J. E. Gray, at the request of the Secretary, exhibited numerous specimens of the group of *Cirripedes*, Lam., and he entered upon a historical sketch of the progress of natural science with respect to these animals. He also exhibited a diagram illustrative of the five families contained in that group, and

he pointed out their distinguishing characters, and at the same time the circular succession of affinities by which they succeed each other.

July 26.—Mr. Bell exhibited a series of specimens of the *Chelonian Reptiles*, and more particularly of the genera *Testudo*, Auct., *Emys*, Brongn., *Terrapene*, Merr., and *Kinosternon*, Spix. He dwelt on these two latter genera in particular, which compose the group commonly known by the name of *Box Tortoises*; and he illustrated the characters of a new genus which he had added to the group, his genus *Sternothærus*, from specimens which he laid before the meeting.

November 8.—A paper was read entitled “Descriptions of some new species of birds belonging to the genera *Phytotoma*, Gmel., *Indicator*, Vieill., and *Cursorius*, Lath.,” by Mr. Benjamin Leadbeater, F.L.S.

November 22.—The Secretary exhibited a specimen of the Tabuan Parrot, *Psittacus Tabuensis*, Lath., belonging to Mr. Leadbeater, and which that gentleman requested to be laid before the meeting. In the course of some observations on the occasion, the Secretary entered into the history of the specimen, which is one of the two individuals brought home from the Island of Tongataboo by the late Captain Cook. He afterwards explained the situation of this rare species in the family of *Psittacidae*, referring it to the genus *Platycercus*, one of the lately characterised groups of that family.

Mr. Brookes exhibited several specimens of Birds referable to the genera *Dendrocolaptes*, Herm., *Synallaxis*, Vieill., &c. One of these presented a new type of the family of *Laniadae*.

Mr. Vigors read a continuation of the “Catalogue of New Holland Birds in the Collection of the Linnean Society;” by Dr. Horsfield and himself.

On *November 29*, the second Anniversary Meeting of the Zoological Club took place, when the following members were appointed Committee and Officers for the year ensuing.

J. E. Bicheno, Esq. Sec. L.S. *Chairman*; J. F. Stephens, Esq. *Treasurer*; N. A. Vigors, Esq. *Secretary*; Joseph Sabine, Esq.,

Joshua Brookes, Esq., E. T. Bennett, Esq., J. G. Children, Esq., Thomas Bell, Esq., and W. J. Broderip, Esq.

December 13.—Mr. Stephens exhibited specimens of six species of the genus *Dytiscus*, Auct., recently collected in the counties of Huntingdon and Cambridge. Three of these species he stated to have been hitherto unnoticed as natives of the British Islands, and two of these three to be as yet undescribed. He pointed out their names and affinities as follows :

* *Sterni bifidi processu obtuso.*

I. *D. dimidiatus.* Gyllenhal.

1. *D. punctulatus.* Fab.

** *Sterni bifidi processu acuto.*

a. *Fæminæ elytris sulcatis.*

3. *D. marginalis.* Linn.

4. *D. circumflexus.* Fab.

5. *D. angustatus.* Steph.

b. *Fæminæ elytris sine sulcis.*

9. *D. excrucians.* Steph.

The last section of these insects, in which the females are without the furrows on the elytra, Mr. Stephens described as leading immediately to the genus *Trogus*, Leach. He added that there are several continental species referable to this section : among others, *D. flavoscutellatus*, Fab. He also exhibited a specimen of *Buprestis ænea*, Fab., which had been lately captured in Devonshire.

Mr. Vigors read a continuation of the "Catalogue of New Holland Birds in the Collection of the Linnean Society" by Dr. Horsfield and himself. In this portion of the paper, the Australian species of the family of *Caprimulgidæ* were described ; and the birds themselves, belonging to the genera *Podargus*, Cuv., *Caprimulgus*, Auct., and *Ægotheles*, Vigors and Horsf., of which the type is the *Crested Goatsucker* of White's Journal and Phillips's Botany Bay, were exhibited to the meeting. Mr. Vigors also illustrated the affinities of the family by exhibiting

several additional species belonging to it, from his own cabinet and that of Mr. Leadbeater: in particular, two undescribed species of the South American genus *Nyctibius*, Vieill.; and several specimens of the true *Caprimulgus*, among others *C. psalurus*, Temm., ♂ and ♀; *C. macrodipterus*, Afzel.; a new species from Africa figured by Dr. Latham in the new edition of his "Synopsis" as the *Long-tailed Goatsucker*; &c. &c.

January 10, 1826.—Mr. Bell exhibited a living specimen of the *Grison*, an animal described by Buffon under the name of *Fouine de la Guiane*, by Linnæus under that of *Viverra vittata*, and by Desmarest as the *Gulo vittatus*. He entered at considerable length into a history of its habits, as observed by him during the last ten months; dwelling particularly on its determined pursuit of *Reptiles*, which had proved fatal to two *Alligators* in his collection, and on its fondness for eggs. Its mode of eating the latter he stated to be peculiar. After playing with them for a considerable time, it secured them between its fore paws, and inserted one of its canine teeth through the shell, so as to form an orifice, through which it sucked so much of the contents as it could obtain by these means. This orifice it afterwards enlarged by degrees, continuing to suck, until it was enabled to insert its tongue; and when at length it could obtain no more by these processes, it broke up the shell completely, and licked clean the inside of each separate fragment. Mr. Bell therefore conjectured that *Reptiles* and the eggs of *Birds* formed the proper food of the animal in a state of nature, so far at least as could be judged from his own specimen, which was completely domesticated, and as playful and harmless as a cat. This individual he added, had been taken from a nest while yet young by the captain of a trading vessel, had been preserved as a playmate for his children, and had thus become completely familiar; exhibiting, (except in its attacks upon living *Reptiles*,) none of those ferocious and sanguinary traits of character described by Captain Stedman in his Voyage to Guiana. Its appetite Mr. Bell stated to be by no means voracious, neither did it ever become somnolent after its meal. Differing in these respects materially from the habits of the genus *Gulo*, and distinguished also by its four molar

teeth on each side of the lower jaw, Mr. Bell conceived that it ought no longer to be referred to that genus. He therefore declared his intention of characterizing it at an early opportunity, as the type of a new genus to which he proposed to assign the name of *Galictis*.

The same gentleman also exhibited a living specimen of an undescribed species of *Coluber* from Brazil, the upper surface of which was dark fuscous crossed by obsolete red *fasciæ*, and the under surface yellow, marked with bright red undulated *fasciæ*, closely resembling the veining of certain marbles. This animal he also stated it to be his intention to describe at the earliest opportunity.

Mr. Bell also exhibited a living specimen of his recently described species of *Terrapene*, the *T. nebulosa*, remarkable as being twice the size of any previously noticed species of *Box Tortoise*.

Mr. Stephens exhibited specimens of the *larvæ* of an *Ichneumon*, which fed upon the *larvæ* of *Lerura vinula*. They were disturbed by him in September last, at the moment of their being about to become *pupæ*. Two only underwent the transformation: from these Mr. Stephens hopes to ascertain the species. The remainder after spinning a considerable quantity of web, did not appear to have sufficient strength to complete their change. They have since remained in the same state and still are alive.

The Secretary read a Paper entitled "Description of the *Plectrophanes Lapponica*, Meyer, (*Fringilla Lapponica*, Linn.), a specimen of which was captured some time since in Cambridge-shire," by P. J. Selby, Esq. F.L.S., M.W.S., &c.

January 24.—The Secretary exhibited a specimen of the *Anas rufina* of Pallas, [*Fuligula rufina* of Shaw's Zoology,] which had been lately met with in Leadenhall Market, among some ducks that had been taken in a decoy during the late severe season. It was observed that the species is not uncommon in the Menageries of this country; and that a specimen might have escaped from confinement, and been found at large with others of the same family. But on the other hand it appeared that the specimen was in a perfect state of plumage and consequently

could not have been lately in a domesticated state ; neither could it have regained its perfect plumage after having formerly escaped from confinement, as it appeared to be a young bird of last year. There appeared every reason to suppose that the individual was an accidental visitor of this country, driven over here by the late severe weather, and consequently that it had a claim, like other occasional visitors of these Islands, to a place in the British Fauna.

Mr. Vigors read a continuation of the " Catalogue of the New Holland Birds in the Linnean Society's collection," by Dr. Horsfield and himself.

February 14.—Mr. Vigors read some extracts from a letter which he received from W. S. MacLeay, Esq. F.L.S., dated from the Havannah, December 27th, 1825. The extracts consisted of Ornithological observations made by that gentleman, during his voyage from England to the Island of Cuba, in the months of October, November, and December, 1825; including remarks on the Ornithology of the Islands of Madeira, Teneriffe, and St. Jago; as also a few cursory observations made at Barbadoes, Martinique, and off the coast of St. Domingo, on the same subject.

Mr. Vigors entered into an explanation of the natural affinities that connect the tribe of *Tenuirostres* in Ornithology; pointing out the different subdivisions or families into which it is separated, and illustrating the chief character of each by a reference to the typical species, which he exhibited to the Club. He dwelt chiefly on the family of *Trochilidæ*, most of the leading forms of which he produced before the meeting; and he signified his intention of continuing the subject at a subsequent meeting of the Club.

February 28.—Dr. Horsfield exhibited a specimen of a Mammiferous Animal, lately described by M. F. Cuvier under the name of *Ailurus fulgens*, which had been procured in Nepal, and subsequently presented to the Linnean Society by Major General Hardwicke. Dr. Horsfield pointed out to the meeting the distinguishing characters of this animal, and entered into an explanation of the station which it appears to hold in a natural arrangement of the *Mammalia*. The specimen from which M. F. Cuvier drew his description being defective, particularly with

respect to its teeth, the details into which Dr. Horsfield was enabled to enter in consequence of the perfect state of preservation of the animal in the Society's collection, and which he signified his intention of speedily submitting to the public, were of considerable importance and interest.

A paper entitled "Observations on a species of *Simia*, Linn., now alive in the collection at Exeter Change, allied to, if not identical with, the *Simia Lagothrica* of Baron Humboldt;" by Edward Griffiths, Esq. F.L.S., &c. was read by the Secretary.

GEOLOGICAL SOCIETY.

November 4.—A paper was read entitled, "An Account of some Geological Specimens collected by Captain P. P. King, in his Survey of the Coasts of Australia; and by Robert Brown, Esq., on the Shores of the Gulf of Carpentaria, during the Voyage of Captain Flinders; by W. H. Fitton, M.D. V.P.G.S., &c. The only part of this paper which requires notice in the Zoological Journal, is an account of a recent breccia containing shells, of which the following is an abstract:

The shore on the western coast of Australia is in several places covered with extensive dunes of sand, with which are associated in many instances beds and masses of a very recent arenaceous breccia, abounding in shells concreted by carbonate of lime. This formation, which is particularly remarkable in the islands and on the shores adjacent to Shark's Bay, about latitude 25°, is analogous to that which occurs very extensively in Sicily, at Nice, and several other places on the shores of the Mediterranean, and of the West Indian Islands, and on many parts of the coasts within the Tropics. In New Holland it generally consists of sand, cemented by stalagmitic or tufaceous carbonate of lime, containing angular fragments of a compound of the same nature, but previously consolidated and broken, along with numerous shells and fragments of shells, very nearly resembling those of the adjacent seas. Its date appears to be more recent than that of the beds

which constitute the Paris and London basins ; but anterior to the accumulation of the diluvial gravel.

The calcareous concretions of New Holland have in some instances a tubular and stem-like appearance ; and have thence been mistaken for corals, and petrified branches of trees.

November 18.—A Notice was read, respecting the appearance of Fossil Timber on the Norfolk Coast ; by Richard Taylor, Esq., of Norwich. In consequence of an extraordinary high tide which visited the coast of Norfolk on the 5th of February 1825, large portions of the cliffs, sometimes exceeding 200 feet in height, were precipitated into the sea, and an opportunity was afforded of examining the site of a stratum containing a number of fossil trees, exposed on the east and west side of the town of Cromer. In this singular stratum, composed of laminæ of clay, sand, and vegetable matter, and about four feet in thickness, the trunks were found standing as thickly as is usual in woods, the stumps being firmly rooted in what appears the soil in which they grew. They are invariably broken off about a foot and a half from the base. The stem and branches lie scattered horizontally ; and amongst them are thin layers of decomposed leaves, but no fruits or seed-vessels. The species of timber appear to be chiefly of the Pine tribe ; with occasional specimens of elm and oak : they are flattened by the pressure of the overlying alluvial strata. Mr. Taylor has not observed any animal remains in the stratum, except the skull of one of the Deer tribe ; but he supposes that the bones of Elephants and other herbivorous animals, found near this site, may have been washed out of the same bed.

December 2.—A paper was read entitled, “An Account of an undescribed Fossil Animal from the Yorkshire Coal-field ; by John Atkinson, F.L.S., and Edward Sanderson George, F.L.S.

December 16.—A paper was read, “On the Chalk and Sands beneath it (usually termed Green Sand), in the vicinity of Lyme Regis ; by H. T. De la Beche, Esq. F.G.S., &c.”

Mr. De la Beche observes, that we ought not to suppose that the sands, marles, and clays, which are immediately subjacent to the chalk in the east of England, can be traced into other and distant countries, where however these sands, &c. as a mass, may

be easily recognized. That this cannot be done, even at comparatively short distances, it is the object of this communication to prove, by examples derived from the cliffs at Lyme Regis, in Dorsetshire, and Beer, in Devonshire ; detailed sections of which are given, and the succession of the strata, and the organic remains which they contain, fully described. The author first treats of the chalk, and the sands and sandstone, usually called green sand, as they occur between Lyme Regis and Exmouth ; and then notices the same formations as they are exhibited in the vicinity of Beer.

From this examination it appears, that though there is a great correspondence in the organic remains, considerable changes take place in the mineral composition and characters of the beds both of chalk and underlying sands, in short distances. Mr. De la Beche considers it probable that the Beer-stone is the equivalent of the Malm-rock of Western Sussex.

A paper was also read, entitled, "Geological Sketch of Part of the West of Sussex, and the N. E. of Hants, &c. ; by R. I. Murchison, Esq. F.G.S., &c."

In this memoir, Mr. Murchison describes the geological relations, distribution, and characteristic fossils of the strata of that part of the west of Sussex, which is bounded on the south by the chalk escarpment of the South Downs ; and of that part of Hampshire which is included by the Alton Chalk Hills. These strata, commencing below the chalk, in a descending series, are, 1. Malm-rock, or Upper Green Sand ; 2. Gault ; 3. Ferruginous Green Sand ; 4. Weald Clay. The Weald clay in the valley of Harting Combe may be regarded as the central nucleus of this district, mantling round which, and extending up to either chalk range, the other formations are developed, in regular succession : the breadth and boundaries of each are laid down by the author on a coloured portion of the Ordnance map, to which a section is annexed.

The malm-rock of Western Sussex is identical with the stone of Merstham : it is characterized by constituting terraces which afford a rich soil favourable to wheat. It sometimes furnishes a building stone, contains occasionally a calcareous blue chert, and abounds in organic remains.

The gault of this district has been cut through to the depth of 120 feet, at Alice Holt, and iridescent Ammonites and other fossils are found in it. This clay is marked by fertile water-meadows, and the timber presenting a green belt clearly distinguishes it from the rich wheat land of the malm rock above, and the arid expanse of the ferruginous green sand below it.

Of this latter formation, the upper beds consist of pure white sand, and in some places compact ironstone, and ironstone in large cellular tubes are found. In the middle beds occurs a calcareo-siliceous grit, called Bargate stone; in the lower, a siliceous yellow building stone, containing casts of Ammonites, *Terebratulæ*, &c. The Weald clay includes in its middle beds the compact Petworth marble, and in lower beds of clay, in which tabular calcareous grit occurs, Mr. Murchison has discovered, together with scattered shells of the *Vivipara fluviorum*, the bones of a large unknown vertebrated animal, specimens and drawings of which accompany this memoir.

January 20, 1826.—The reading of a paper was concluded, "On the Geology of Jamaica; by H. T. De la Beche, Esq. F.R.S. F.G.S., &c." The following is an abstract of a portion of Mr. De la Beche's communication, relating to a tertiary formation in Jamaica, and the organic remains it includes.

Trap rocks, consisting of porphyritic conglomerate, porphyry, greenstone, and syenite, shew themselves very extensively in Jamaica, composing the greater part of the St. John's mountains, and the district bordering on the Agua Alta. These trap rocks are found, generally, supporting the *Great White-Limestone formation*, which occupies a very large portion of the whole island. This formation, from the fossils it contains, is referred by Mr. De la Beche to the Tertiary series. It is principally composed of white limestone, most frequently very compact, and then strongly resembling the compact varieties of the Jura limestone. The strata are usually very thick, varying from three to twenty feet in breadth. In some districts, this rock is interstratified with thick beds of red marle, and sandstone, and white chalky marle. The compact limestone constitutes the middle part of the formation: the lower beds consist, chiefly, of sands and marles, some-

times associated with bluish-gray compact limestones, at others with beds of earthy yellowish-white limestone, containing an abundance of organic remains, viz. Echinites, *Ostrææ*, and a particularly large species of *Cerithium*. The upper beds of the formation, are rather chalky, sandy, and marly, and contain numerous remains of the genera *Conus*, *Cerithium*, *Astarte*, *Natica*, &c.; and near the sea coast a great quantity of corals, which frequently have almost a recent appearance.

February 17.—At the Anniversary Meeting of the Society held this day, the following gentlemen were elected Officers and Council for the year ensuing:—

President.—John Bostock, M.D. F.R.S.

Vice-Presidents.—Sir Alexander Crichton, M.D. F.R. and L.S. Hon. Mem. Imp. Acad. St. Petersburg; Rev. W. D. Conybeare, F.R.S.; William Henry Fitton, M. D. F.R.S.; and Charles Stokes, Esq. F.R.A. and L.S.

Secretaries.—W. J. Broderip, Esq. F.L.S.; R. I. Murchison, Esq.; and Thomas Webster, Esq.

Foreign Secretary.—Henry Heuland, Esq.

Treasurer.—John Taylor, Esq., F.R.S.

Council.—Arthur Aikin, Esq. F.L.S.; Henry Thomas Dela Beche, Esq. F.R. and L.S.; J. E. Bichenow, Esq. Sec. L.S.; Henry Thomas Colebrooke, Esq. F.R.S.L. and E., F.L. and Asiat. Soc.; Sir Charles Henry Colvil; George Bellas Greenough, Esq. F.R. and L.S.; Sir Charles Lemon, Bart. F.R.S.; Armand Levi, Esq.; Charles Lyell, Esq. F.R. and L.S.; William Hasledine Pepys, Esq. F.R.S. L.S. and H.S.; George Poulett Scrope, Esq.; J. F. Vandercom, Esq.; and Henry Warburton, Esq. F.R.S.

March 3.—The reading of Sir A. Crichton's paper, on the Taunus Mountains in Nassau, which had been commenced on the third of February, was concluded.

The valley of the Mayne, which is interposed between the northern and southern chains of the Taunus, consisting of transition and trap rocks, in the duchy of Nassau, is chiefly occupied by low hills of coarse shelly limestone, analogous to the upper freshwater formation of Paris, and quarries of it occur near Wisbaden and Hockheim: *Paludinæ* and *Modiolæ* abound in it. At

Hockheim the beds are much dislocated, and at Wisbaden fossil bones are found, the teeth accompanying which refer them to animals allied to the *Lophiodon tapiroides*, and to the Sumatran Tapir. These calcareous deposits are only 200 feet above the level of the Mayne, and they are perforated in many places by basalt, upon which they rest. The basalt finally disappears south-east of Darmstadt, and is succeeded by primitive rocks. There are strong salt-springs at Soden, and various mineral waters near Frankfort and Hadnigstein.

The Falkenstein mountain, though composed of talc-slate, protrudes through the high table land in the form of basalt. To the north of this the older rocks disappear, and the district is occupied by grauwacké. The grauwacké is divided into quartzzy grauwacké and grauwacké slate; the latter is very distinct from micaceous slate, and contains casts of *Spiriferi*, of the *Pleurobranchi* of Cuvier, &c.; the former offers Encrinites, and unknown coralloids.

At the meetings of this Society on *March 17*, *April 7*, and *April 21*, no business was transacted which requires notice in the Zoological Journal; except that at the meeting on *April 7*, R. I. Murchison, Esq. F.R.S., one of the Secretaries, presented a cast of the superior portion of a gigantic Saurian femur, from Sussex.

ROYAL ACADEMY OF SCIENCES OF PARIS.

March 7.—M. de Lacepède made a verbal report on M. Virey's *History of the Human Race*. M. Geoffroy Saint-Hilaire concluded the reading of his Memoir *On the Fossil Reptile of Caen or Telcosaurus*; and he announced another, *On the Skull of the Mummy of a Crocodile found in the Catacombs of Thebes, and on its relations to those of the Animals, presumed to be of the same Species, which now exist in Egypt*. M. Edwards read a Memoir, *On the Muscular Contractions produced by the contact of a solid body with the Nerves, without the Galvanic Action*.

March 14.—M. Cuvier read a Memoir, On the *Myripristis*, a new genus of Fishes of the family of Perches, remarkable for the connexion of its swimming-bladder with its ear. M. Auzoux presented a specimen of artificial anatomy, “*en pâte de carton*.”

March 21.—The Academy received in manuscript, *A New Classification of the Animal Kingdom*, by M. Lamouroux. M. Cuvier read a letter from M. Bredin, Director of the Veterinary College of Lyons, on the Fossil Bones discovered in a garden at Calvire, in a place called *la Croix-Rousse*. They have belonged to Horses, Oxen, and Elephants, and there are several assemblages of them. M. Cuvier has recognized them to be truly fossil bones: those of Elephants are of the species called the Mammoth, or the common fossil Elephant. M. Cuvier afterwards read a Memoir, *On the Fresh-water Fishes of India, which have the power of living for a long time out of water, and on the organs from which they derive this power*. These Fishes are found on the trees growing on the banks of certain ponds, at the height of six feet above the water.

March 28.—M. G. Saint-Hilaire exhibited the head of a monstrous Colt, foaled two days before at the Veterinary College at Alfort, and which he had dissected with M. Serres. This head, the left side of which is much larger than the right, does not present, at first sight, in the interior of the cranium, any traces of foramina or of optic nerves, although the eyes were in appearance well formed. M. Serres purposes, by means of comparative researches on the eyes of the Mole and of some other animals, to explain the anomalies in this Colt's head by the common rules of *Encephalogenesis*. M. Traullè read *A Sketch on the Deluge, on its consequences and producing cause, and on the occurrence in the North of the two Continents, of the Bones of Animals belonging to southern Climates*.

April 4.—M. M. Portal and Duméril gave a very favourable report on M. Auzoux's specimen of artificial anatomy.

April 11.—M. G. Saint-Hilaire read a Memoir, entitled *Researches on some facts respecting the organization of the Gavials, and on the necessity of separating them from the Crocodiles, as a distinct genus*.

April 18.—M. Majendie, in the name of a Committee, read a report on M. Dupont's collections of Animals and Anatomical Preparations. The Committee observe, "We have expressed to M. Dupont our satisfaction at the manner in which he has prepared and stuffed the Birds, and preserved the *Papiliones*; but it is not to this kind of merit that we would call the attention of the Academy. M. Dupont has for several years devoted himself, and with indisputable success, to the art of modelling in wax. The articles which have been submitted to us have all the perfection to which this art can be carried. In some respects indeed, such as those of the truth of the colours and transparency of the organs, M. Dupont has surpassed his predecessors. Your Committee are then of opinion that this young naturalist is endowed with the talents necessary for practising with the greatest success the art of modelling in wax, that he merits the commendation of the Academy, and that it is desirable to encourage so useful an art."

April 25.—M. M. Quoy and Gaymard read a Memoir entitled, *A Description of five new genera of Mollusca, and four new genera of Zoophytes, discovered in the Voyage round the World under Captain Freycinet*. M. Duveau read a Memoir entitled, *New Researches on the Natural History of the Aphides*.

May 2.—M. Moreau de Jonnés commenced the reading of a memoir, entitled, *Monographic researches on the indigenous Dog of the American hemisphere; the different species of it, their synonymy, forms, habits, domestic uses, extinction, geographical distribution and migrations: and on the notions to which they lead, respecting the ancient state of the New World, and the communications of its inhabitants with each other; and their original country*.

May 16.—M. Marcel de Serres transmitted a memoir, *On some remains of the Mastodon angustidens, or Mastodon of Simorre, recently found in several parts of Europe, and especially in the neighbourhood of Montpellier*. M. Moreau de Jonnés continued the reading of his memoir *on the American Dog*.

May 23.—M. Geoffroy Saint-Hilaire, on behalf of the Committee for the prize in medical science, proposed the following:

“Give the general and comparative history of the circulation of the blood, in the four classes of vertebrated animals, before and after birth, and at different ages.” He also began the reading of a memoir, *On the general views respecting monstrosity, with the description of a new kind observed in the human species, named aspalasome.*

June 8.—The Academy being informed by M. Arago, that he now had at Paris two living Camelions, appointed a Committee to make experiments on the changes of colour which the skin of these animals undergoes. Mr. D. Barry, staff-surgeon in the English service, read a memoir *On the motion of the blood in the veins.*

June 13.—M. Bosc gave a report on M. Duveau's *New researches on the Natural History of the Aphides.*

June 27.—M. Zugenbuhler claimed, by letter, the priority of the ideas stated in Mr. Barry's paper above mentioned; transmitting a copy of a dissertation printed by him six years before, and entitled “*Dissertatio de motu sanguinis per venas.*”

July 4.—M. Bussy read a memoir *On the action of heat upon the fatty bodies.*

July 11.—M. Dupuy read his first memoir *On the distillation of the fatty bodies.*

July 18.—M. Cuvier made a favourable report on the Zoological Collections brought home by the naturalists attached to the late expedition under M. Duperrey.

August 1.—M. de St. Hilaire read an extract from a work on human monsters characterized by the absence of the arbrospinal marrow, and named *anencephalu.*

August 8.—A memoir by M.M. Quoy and Gaymard was read, entitled, *Observations on certain Crustacea, considered with regard to their habits and geographical distribution; succeeded by the description of some new species, discovered during M. Freycinet's circumnavigation of the globe.*

September 12.—M. G. de St. Hilaire commenced the reading of a memoir entitled *On the beings of the intermediate degrees of the animal scale, which respire both in the air and under water, and which possess respiratory organs of two kinds, developed to a*

certain extent. He presented a specimen of the *Birgus Latro*, in which, besides *branchiæ*, there are organs which M. Geoffroy regards as *lungs*.

September 19.—M. de St. Hilaire continued the reading of his memoir; and on

September 26, he exhibited several living specimens of the common Crab, *C. Mænas*, and detailed verbally the results of his researches on the respiration of the *Crustacea*.

October 3.—M.M. Quoy and Gaymard read some *Zoological observations on the Corals, made in the bay of Coupang, at Timor, and in the Isle of Guam, in the Mariannes*.

October 24.—M. G. de St. Hilaire read a memoir *On the Olfactory organs of Fishes*.

October 31.—M. Serres communicated a work, in manuscript, *On the comparative Anatomy of Animal Monsters*.

November 7.—M. Latreille was appointed to make a verbal report on M. de Blainville's "*Manuel de Malacologie et de Conchyologie*." M. de Ferussac read a memoir, entitled, *A methodical view of the class Cephalopoda, presenting a new classification*; by M. Dessalines d'Orbigny, jun.

November 14.—M.M. Geoffroy de St. Hilaire, Latreille, and Duméril gave a report on M. Serres's work *On animal monsters*. M. Duméril gave a verbal account of M. de Blainville's *Comparative Anatomy*.

November 21.—M. de Blainville was elected a member of the Class of Anatomy and Zoology, in the room of M. de Lacepède, deceased.

November 28.—The President announced that the king had granted a pension of 1200 francs to M. de Savigny.

December 5.—M. Dejean presented a memoir on the tribe of *Simplicipedes*, in the family of *Carabidæ*.

December 12.—M.M. de St. Hilaire and Latreille made a very favourable report on M. d'Orbigny's memoir on the *Cephalopodous Mollusca*.

December 19.—M. Gaymard read a memoir, entitled, *A Description of some lithophyte polypi of the genera Fungia, Caryophyllia, Madrepora, Meandrina, and Pocillophora, observed in*

the Isle of France, at Timor, and at Guam, during the voyage of M. de Freycinet; by M.M. Quoy and Gaymard. M. Bory de St. Vincent informed the Academy of the completion of his great work, on the classification and history of microscopic animals.

January 9, 1826.—M. de St. Hilaire presented a human monster which had been found, embalmed, among the mummies brought from Egypt by M. Passalacqua; and he also read a notice on the subject.

January 16.—The same naturalist read a memoir, entitled, *Zoological and Physiological considerations relating to a new genus of monstrosities called hypognalle, established to include three species of double-headed Calves, with heads opposed to each other, and attached together by the symphysis of their lower jaws*; and on

January 23, he made a verbal report on Dr. Granville's memoir on Egyptian Mummies.* M.M. Huzard, Chaussier, and Majendie, made a very favourable report on M. Girard's memoir *On the inguinal hernia of the ruminantia and the monodactyli*.

E. W. B.

ART. LXIII. Scientific Notices.

CONCHOLOGICAL NOTICES BY DR. TURTON.

A fine specimen of the *Panopæa Glycymeris* has been dredged up at Scarborough, and is in the cabinet of Mr. Bean. A single valve, with part of the fish in it, has also been found, more lately, on Abarlady sands in North Britain.

At Scarborough has also been taken the *Buccinum Anglicum* of Lamarck; *B. striatum* of Pennant.

A living specimen of the *Buccinum glaciale* was lately taken by the dredge in Torbay.

* For an abstract of this valuable memoir, see the present volume of the Zool. Journ. p. 272.

Bulimus decollatus was observed to breed in great abundance, for many successive years, in the green-house at Watton, in the south of Devon, the seat of H. Studdy, Esq. lodged in the earth, under the wood-work, whence they wandered abroad in the summer. This wood-work, and the earth, were removed, and replaced with stone, by which the colony was lost; and all that were preserved we owe to the care of Mrs. Griffiths and Miss Hill.

Bulimus lineatus, the *Turbo fuscus* of Walker, is found abundantly in wet springy places, in various parts of Devonshire, imbedded among the *Jungermannia*, constantly exposed to the drippings of springs. A variety is also found of a pale yellowish colour.

Bulimus Clavulus, the *Cochlicella Clavulus* of Ferrussac, and which Mr. Miller found in pine-beds, at Bristol; may now be considered to be naturalized, as much as the *Testacellus Maugei*. Mr. Sowerby, in his Genera of Shells, considers it as a species of *Achatina*: but the pillar-lip is well rounded, and not in the least truncate. The only British species of *Achatina* are the *Buccinum terrestre*, and the *Helix Octona* of Authors, if the latter shell may be properly said to be native. Lamarck has placed the *Helix octona* among his *Bulimī*; but the pillar-lip is evidently truncate.

Cyclostoma simile, and *C. acutum*, of Draparnaud, of the more modern genus *Paludina*, are both found in stagnant ditches: the latter is the long lost *Helix Stagnorum* of Gmelin.

Limneus Scaturiginum of Draparnaud, is found on the under surface of the peltate leaves of the white Water-Lily.

Helix pygmaea of Draparnaud, is found abundantly in ditches, under leaves. Leach mistook it for the young of *H. rupestris*, the *H. umbilicata* of Montagu, but it is very distinct, the two species never being found together.

The *Clausilia Rolphii* of Leach, is without doubt the *Clausilia plicatula* of Draparnaud. The specific character may be thus exhibited.

Cl. testā ventricosā, opacā, striis regularibus elevatis: plicis aperturæ quatuor s. quinque, duabus majoribus.

Shell ventricose, opaque, with regular, raised striæ : aperture with four or five plaits, two of which are larger.

Our cabinet presents the following varieties:

a. *Plicis quatuor, duabus mediis minoribus.*

With four plaits, the two middle ones less.

b. *Plicis quinque, tribus mediis minoribus.*

With five plaits, the three middle ones less.

c. *Plicis quinque, tribus inferioribus minoribus.*

With five plaits, the three lower ones less.

At Torquay we found a perfectly formed specimen of the Swiss *Cl. parvula*, mentioned by Dr. Leach. It is much less and more slender than *Cl. rugosa* of Draparnaud, and is very faintly striate, or smooth, except on the lower volution. The two possessed by the Provost of Eton, are no doubt the same. The aperture resembles that of *Cl. rugosa*.

Pupa edentula is by no means uncommon, under stones, in dry situations.

The *Roxania Cranchii* is found in Torbay, and at Scarborough.

Trochus Montacuti is found plentifully in Torbay and the English Channel, and at Scarborough.

The *Scaphander catenatus*, of Leach, with its gizzard, is dredged up at Scarborough.

Several specimens of the *Tritonia Cutacea* were last winter cast on shore at Padstow, in Cornwall.

The *Pileopsis Ungarica* may eventually be considered as a bivalve shell, of the genus *Hipponyx*; as in removing a living specimen from an oyster, we observed a thin laminar under-valve, which is now in our cabinet. The horse-shoe shaped muscular impressions are, also, exactly similar to those of the *Hipponyx*.

Montagu observes, that after the strictest enquiry, he had not been able to fix the sulcated variety of *Cypræa Pediculus*, as a decidedly British production. A living specimen was, however, taken at Weymouth, and which we saw in the cabinet of Miss Warn. If therefore, as Montagu inclines to think, the one with the groove along the back, and that which has no groove, be dis-

inct species, we have them both as natives; although the former may be very rare, and may have been overlooked.

The *Vermilia scabra* of Lamarck, is found both in Cornwall and Torbay, attached to shells and stones.

ON TEREBRATULA COSTATA AND TURBO CARNEUS.

In reading Mr. Lowe's paper in Number V. I observed that he has described two species which had before been described in works of this description, and one of them figured and described as British.

Terebratula costata Zool. Journ. ii. 105, does not appear to differ from *Terebratula aurita* of Fleming's Philosophy of Zoology, ii. p. 498, which is well figured, t. 4. f. 5, of the same work: Dr. Fleming agrees with me in this idea.

Turbo carneus, Zool. Journ. ii. 107, is certainly the same as *Margarita striatus* of Dr. Leach, in the Appendix to Capt. Ross's Voyage, as may be easily seen by his short specific character; but I have verified it, by comparing the plate with the specimen of the latter shell in the Museum.

I may further inquire why is this shell placed in the genus *Turbo* of Lamarck; if it belongs to any genus used by him, it is certainly a *Trochus*, as far as the form of the mouth and structure of the shell and its operculum characterizes that latter genus, and therefore the removal of the other species has necessarily added another synonyma to it; for in the works of succeeding Linnean authors it ought to be called *Trochus margaritus*, and be placed near *Trochus subcarinatus*, the *Helix subcarinatus* of Montague.

I take this opportunity of remarking, that the article Conchology in the Suppl. Ency. Brit. is not by Dr. Leach, but by Dr. Fleming.

J. E. G.

ICHTHYOSAURUS.

Several fossil remains, apparently belonging to *Ichthyosauri*, were found last summer in the blue-lias quarries of Wilmcote, three miles beyond Stratford-on-Avon; and are now in the possession of Mr. Greaves of Barford near Warwick. Messrs. Burchell and Swainson who visited the spot, were informed that these

remains are met with at a depth of from 10 to 20 feet; the superstrata generally consisting of 8 or 10 thin layers of lias, between which are others, much thicker, of friable clay-slate. One of these portions, consisting of the jaws and part of the head, measures only 19 inches. The workmen say that such fossils are not often met with, but that one or two instances can be remembered of these extinct animals having been found in nearly an entire state: the same stratum contains a thin layer of small bivalve shells principally of the genus *Ostrea*, closely crowded together.

We may further remark, that bones of gigantic animals are sometimes found in the new sand-stone formation in the immediate vicinity of Warwick; they are deposited at a depth of about 30 feet in the solid stone, on the surface of a thin horizontal layer of a more friable and earthy kind, called by the workmen *dirt*.

W. S.

PUBLIC INSTRUCTION IN ZOOLOGY.

In the present dearth of means for obtaining instruction in Zoological Science, in this country, as well as to show that considerable interest is taken in the subject by the public, we think it will be useful to notice several courses of public lectures on subjects connected with Zoology, which are now delivering in London.

At the ROYAL INSTITUTION, Dr. Harwood, F.L.S., is delivering a course of popular lectures on the Natural History of the Animal Kingdom, comprehending a survey of the classes Mammalia and Birds. This course is illustrated by a series of excellent drawings of the principal animals described, and of such portions of their anatomical structure as are of peculiar importance; together with specimens of the bones, horns, &c. of the animals.

At the LONDON INSTITUTION, Dr. Harwood is delivering the same course; and we feel much pleasure in stating that at both Institutions he is attended by a very numerous and attentive audience. After his lecture on the *Pachydermata*, on the 20th of March, Dr. Harwood distributed several hundred prospectuses of the New Zoological Institution,* giving at the same time a brief

* This Prospectus we have reprinted at p. 285 of the present volume.

view of its nature and objects, and of the important benefits to society expected to accrue from its establishment.

At the LONDON INSTITUTION also, Dr. Roget, F.R.S., &c., is engaged in delivering an elaborate and very interesting course on the Physiology of the External Senses, as well in man, as in every class of the lower animals: he considers the subjects under the following heads successively: Sensitive functions—Touch—Taste and Smell—Hearing—Vision—and Laws of Perception. The phænomena of Vision are minutely examined and explained; and the lectures are illustrated by a series of drawings and preparations, the latter of which have been principally furnished by Mr. Langstaff. Dr. Roget's course is likewise numerously attended.

At the ROYAL COLLEGE OF SURGEONS Mr. Green, F.R.S. &c., the Professor of Comparative Anatomy, is giving a course of lectures on that subject, which is attended by the members, as well as by many members of the College of Physicians and men of science.

At ST. THOMAS'S HOSPITAL, Mr. J. F. South, F.L.S., has commenced a course on Comparative Anatomy, which is attended by a numerous class of pupils.

THE WILD AND THE DOMESTIC CAT:—THE LYNX.

As M. Temminck's opinion that the Wild Cat is not the *stock* of the domestic animal has been noticed in a former page (531) of the present number, it may be as well to give Dr. Fleming's remarks on the same subject, published in 1822, which nearly agree with those of the continental naturalist.

“The *Felis Catus*, or Wild Cat, which still frequents the remote woods of Britain, is probably a different species from the Domestic Cat, of which it has usually been regarded as the *stock*. The tail of the Domestic Cat is tapering, of the Wild Cat nearly cylindrical. The weight and size of the latter are much larger than the former. The high value which was set upon domestic cats in the ninth century, as appears from the Welsh Laws of Howel the Good; the price of a kitten, before it could see, being a penny; until it caught a mouse, twopence; and when it commenced mouser, fourpence; militates against the commonly-

received opinion. It is probable that the domestic kind is originally from Asia." *Phil. of Zool.* vol. ii. p. 185.

The perusal of M. Temminck's scrutiny of the Feline animals, has also reminded me of the subjoined passage in Mr. De Capel Brooke's lately-published *Travels through Sweden, &c. to the North Cape*; which tends to shew, it would appear, that some species, allied to the Lynxes, occurs in the North of Europe, with which naturalists are as yet unacquainted. The extreme brevity of the tail in the skins examined, if correctly stated, appears to be a character hitherto unnoticed in the genus; as well as the resemblance of one skin to that of the Leopard, but having at the same time tufted ears.

"The Lynx of the north, the Tiger of the polar countries, is not rare in this part of Norway (the province of Drontheim). In the Norwegian language it is called *goupe*, and in the north of Sweden it is generally known by the name of *warjelue*. From the skins of this animal, that were shown to me in different parts of Norway and Lapland, three of which differed very materially in their colour, it seems that there are at least as many species or varieties of the Lynx. Of one of these Mr. Knudtson had several. The largest measured five feet in length, not including the tail, which did not exceed an inch and a half. The colour of them all was gray, with a yellowish tinge, beautifully marked with dark spots, and the ears were tufted. The general price they brought at Drontheim was about five specie dollars, or a pound sterling. This seems to be more peculiar to Norway, as I never observed it during my subsequent travels. Of the two others, which I met with in Lapland and Sweden, one that I saw at Umea measured from the muzzle to the beginning of the tail five feet eleven inches, and the tail was hardly two inches. The appearance of the skin in every respect so much resembled that of the Leopard, that I should have suspected it to have belonged to this animal, had it not been for its tufted ears, and the length and superior thickness of the fur. The third species which I met with in Swedish Lapland, differed so materially from the other two, being of a uniform reddish-brown colour. In length it exceeded five feet."

E. W. B.

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■ ■ ■ The new species, &c. described in this Volume, together with the species, &c., newly characterized, are distinguished by the *Italic* character.



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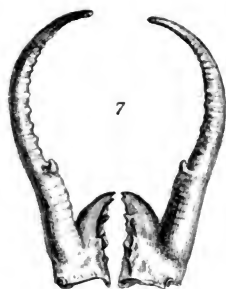
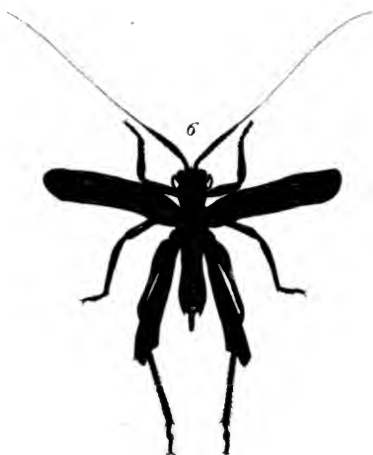
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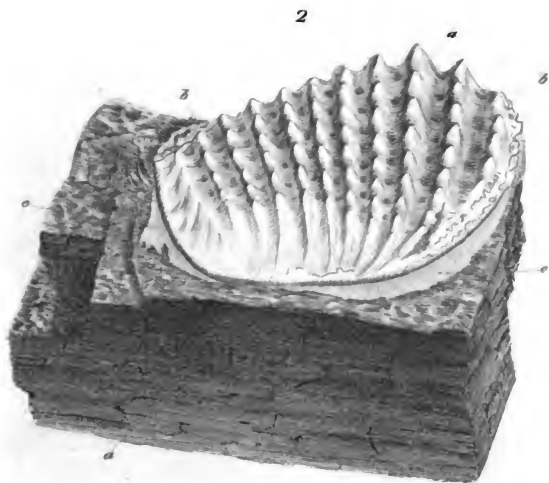
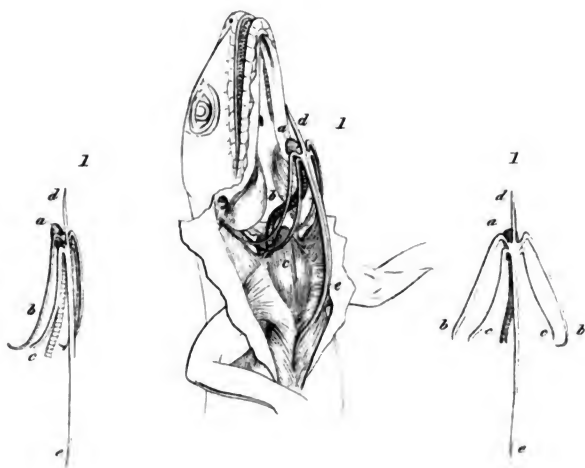
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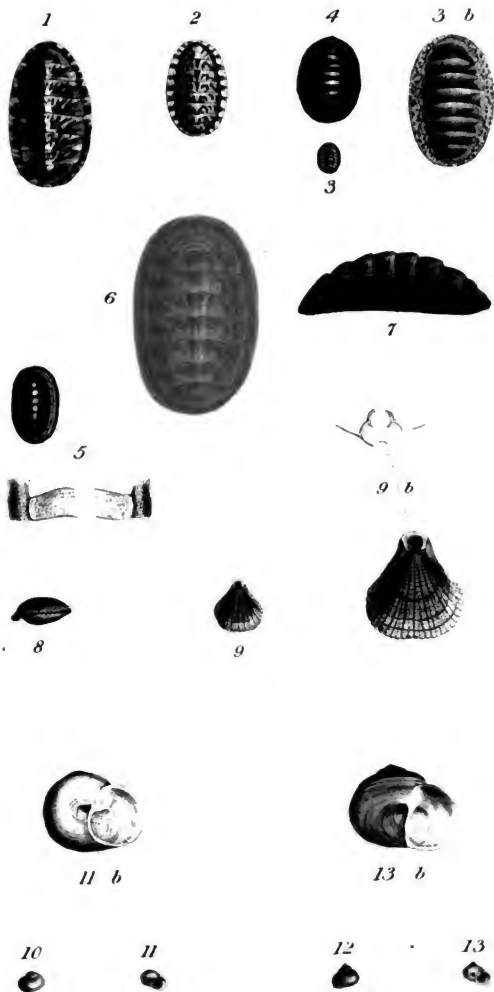
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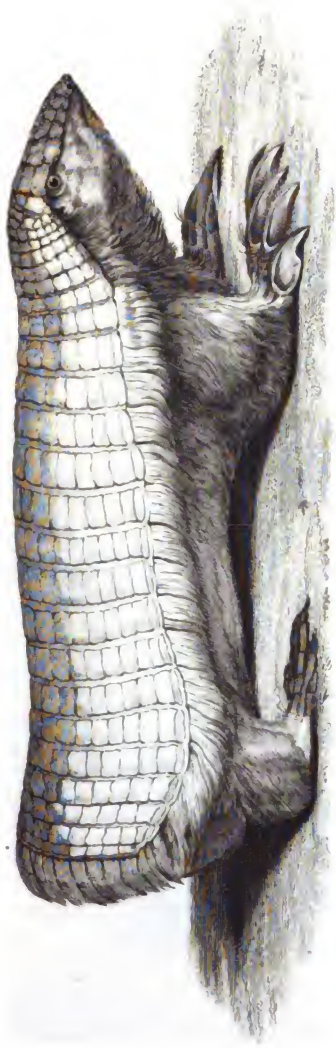




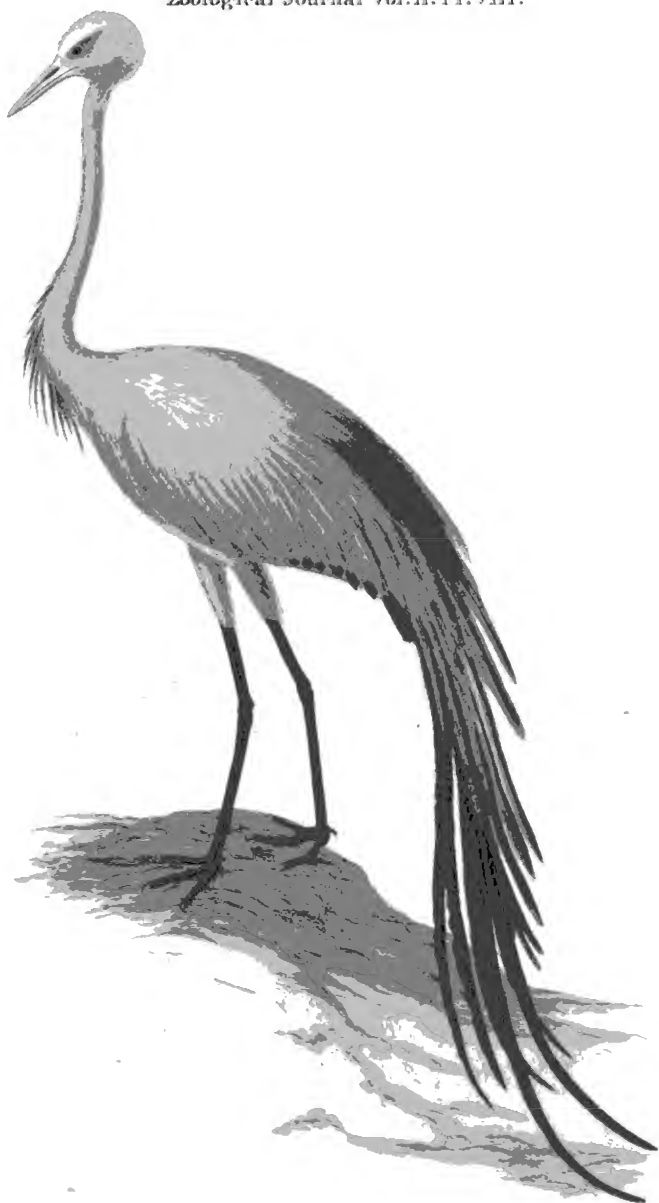














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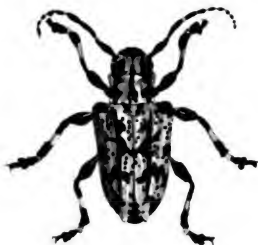
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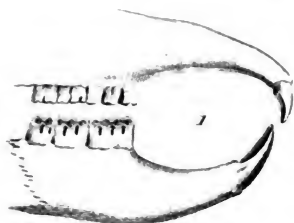
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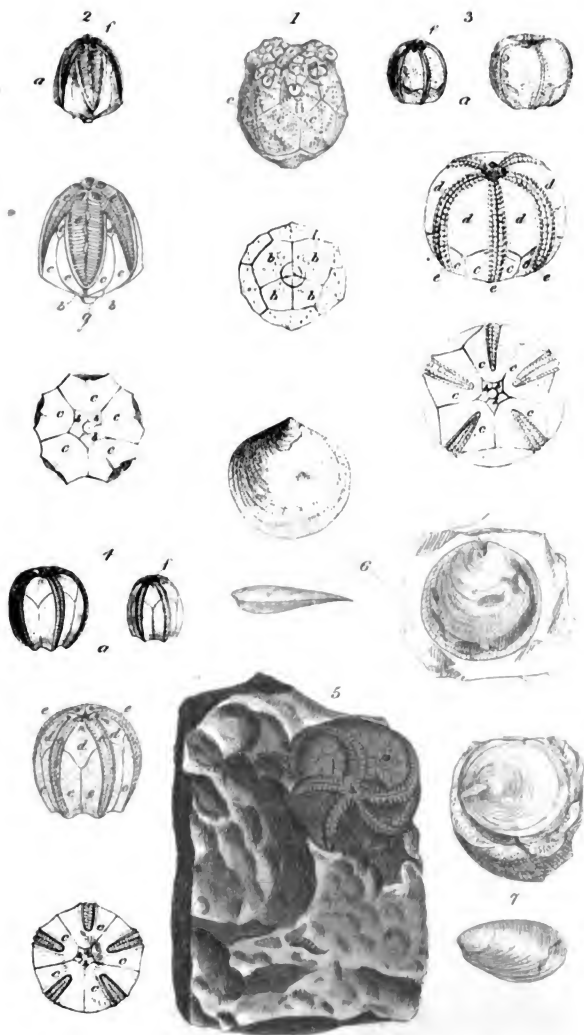


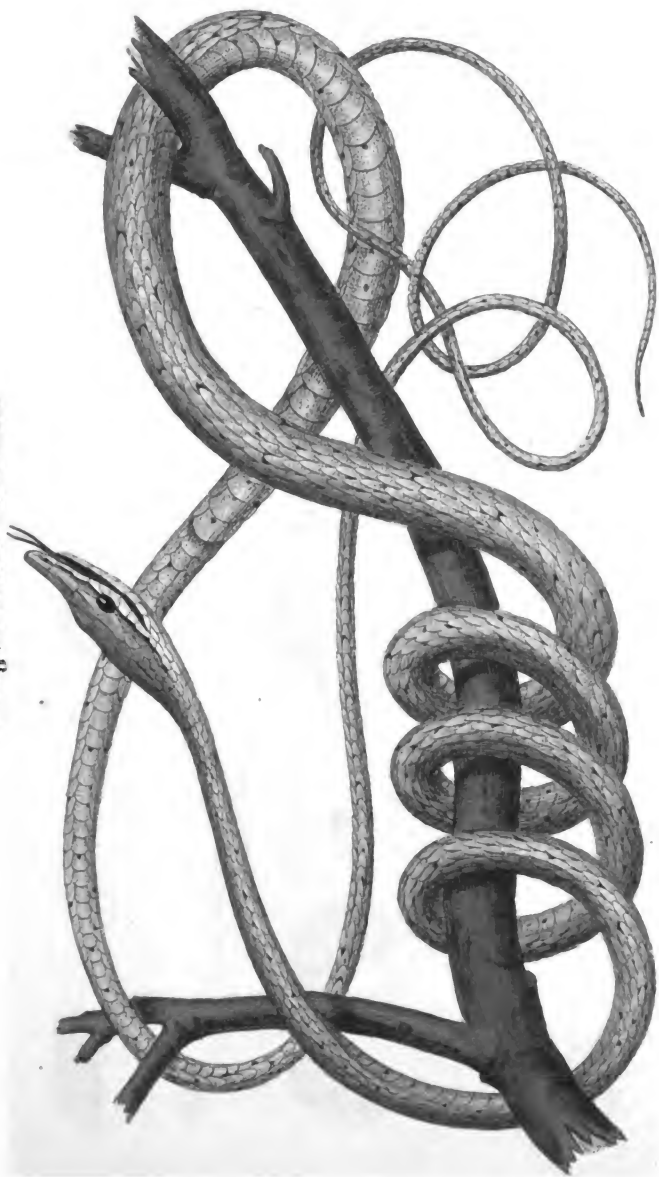
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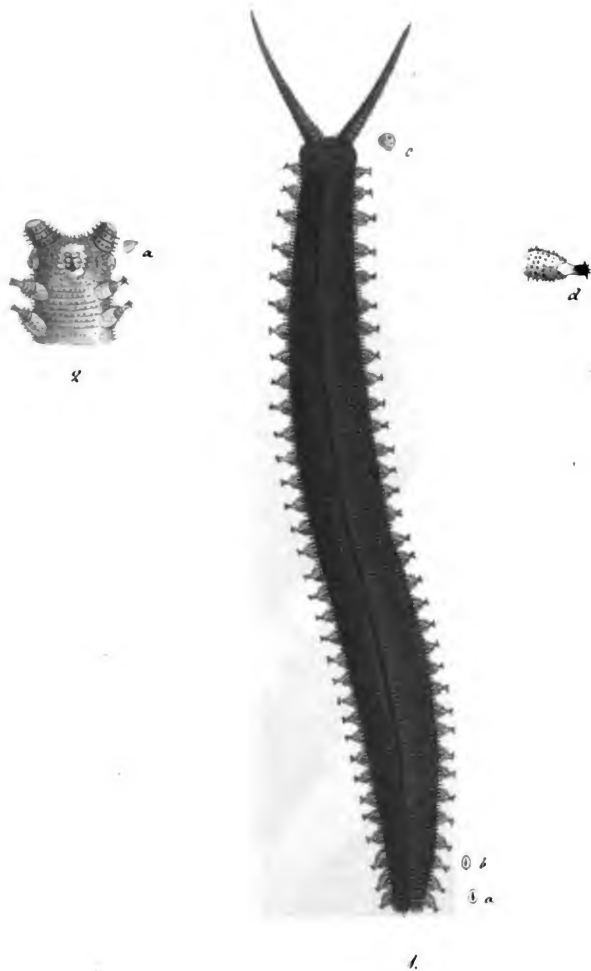
Long rat.



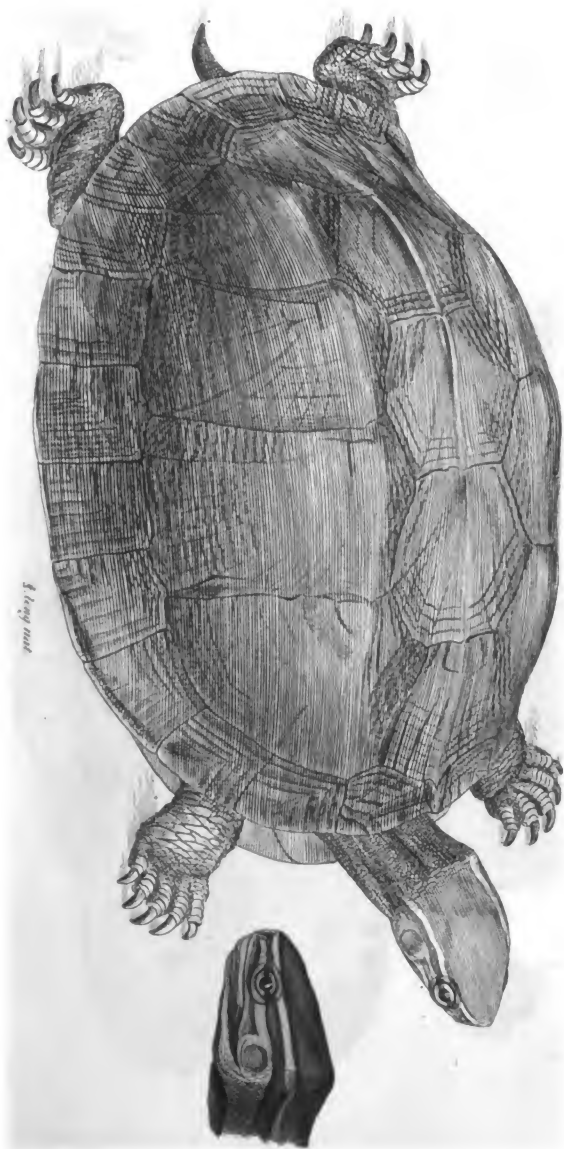












Long neck

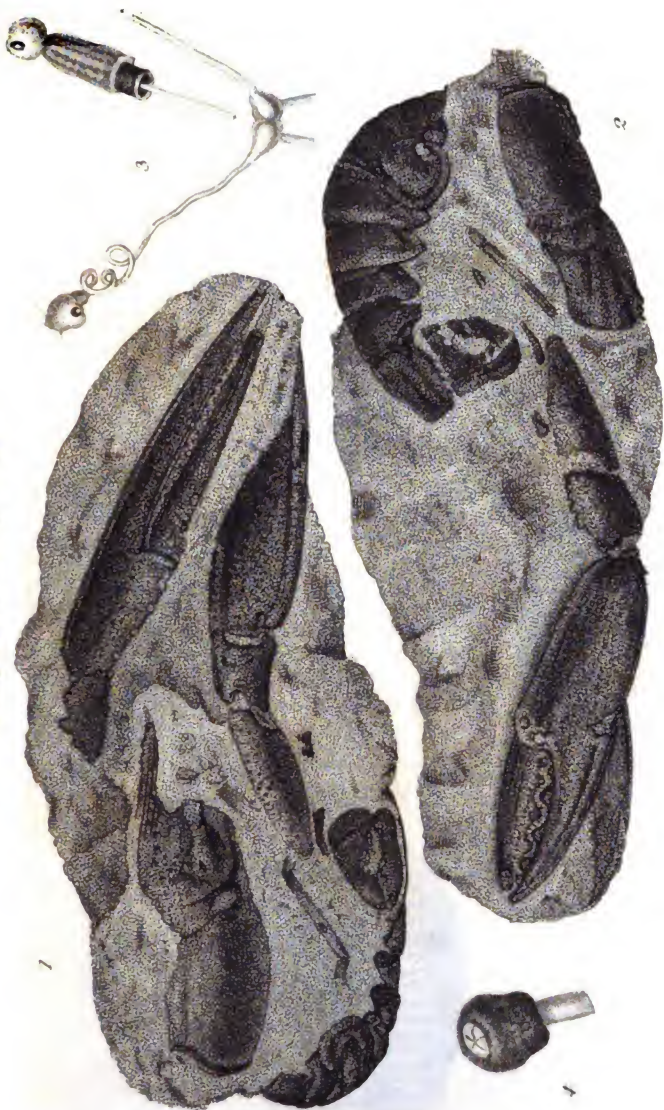


Fig. 1.



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Xanthornus chrysopterus.
♂ long. nat. .



Leistes Suchii.
 $\frac{3}{4}$ long. nat.



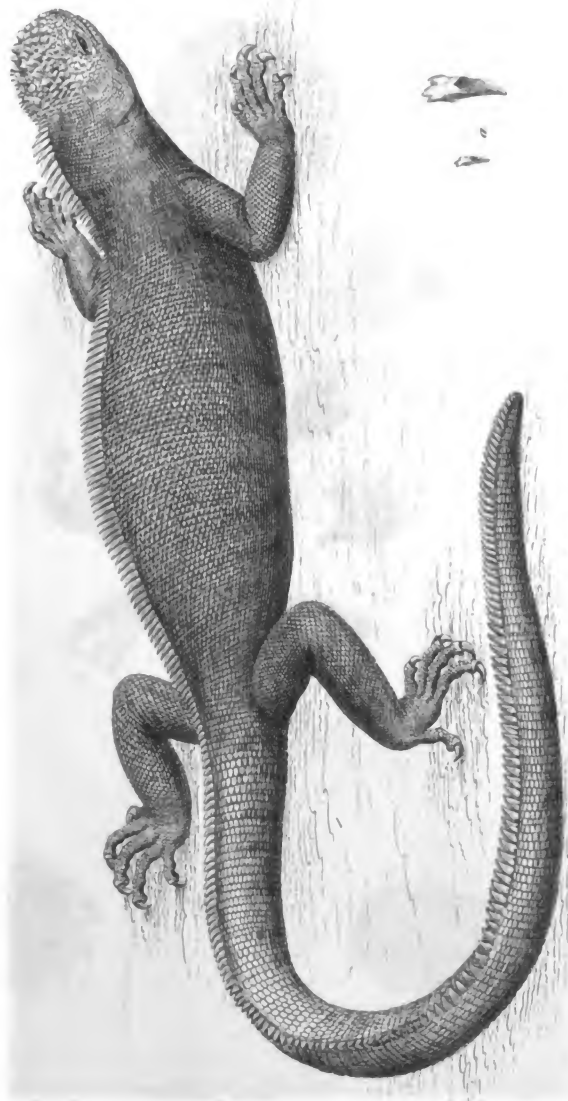
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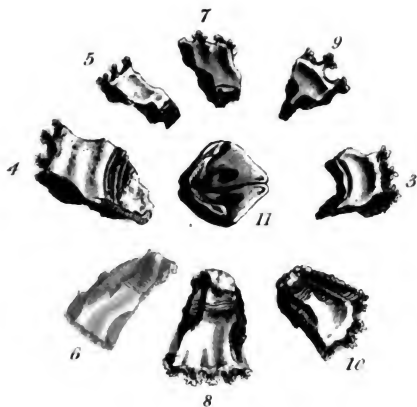
1. *Ranella foliata*.
2. *crumena*.
3. *Muræx saxicela*.



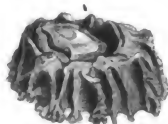
Amblyrhynchus cristatus
3. long nat.



1

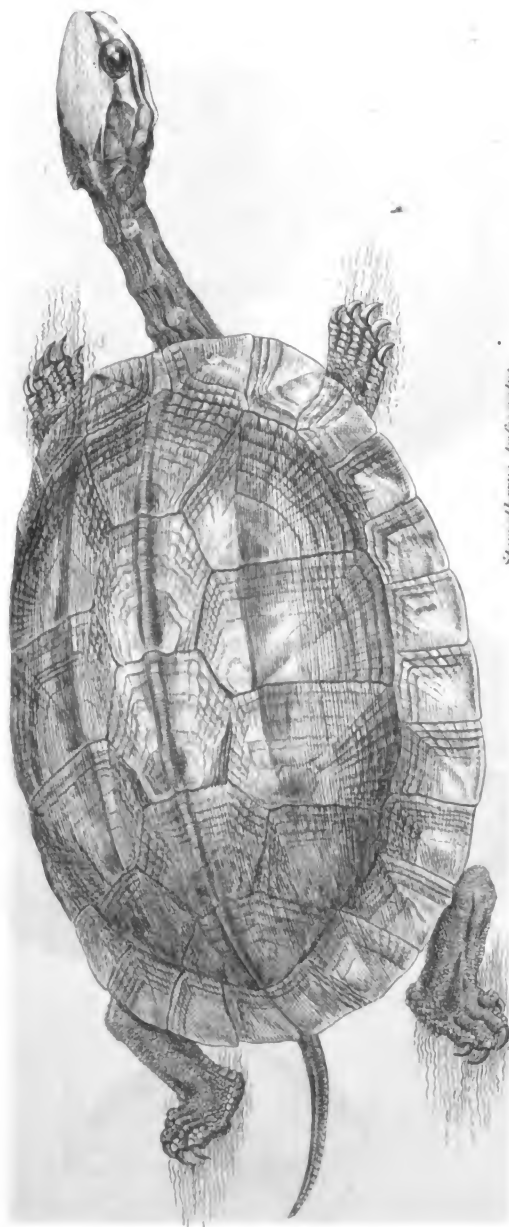


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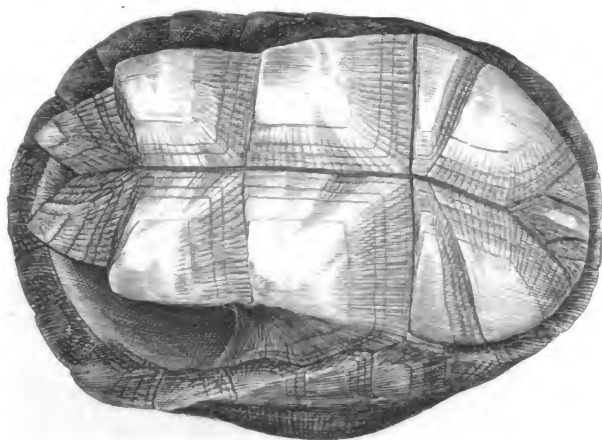
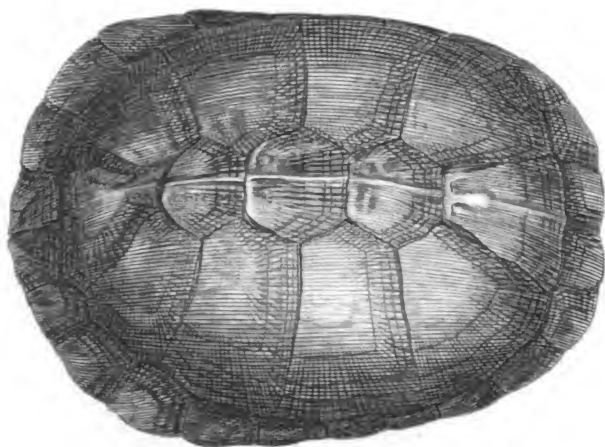


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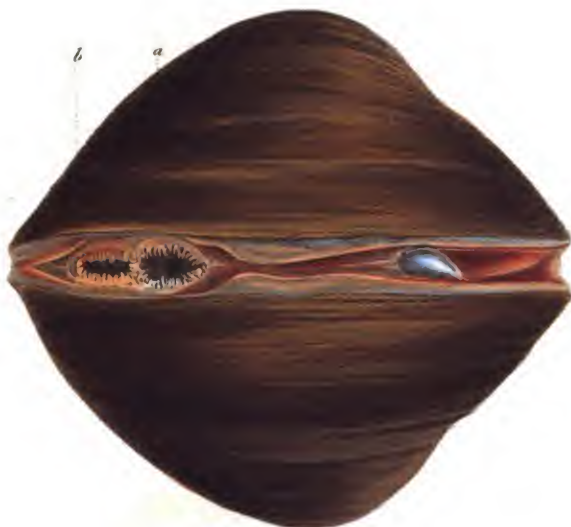
Pecten angulosa.



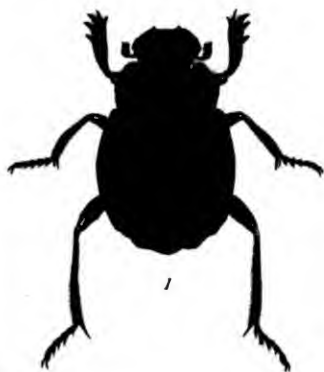
Sternotherus triacanthus.



Sternotherus Leachianus.



Isocardia Cor.



1



3



5 a



2



4



